

FACTORS PREDICTIVE OF COLORECTAL CANCER SCREENING AMONG
MUSLIM MEN AND WOMEN FROM CENTRAL/MIDDLE EASTERN
COUNTRIES LIVING IN NORTH TEXAS

A DISSERTATION
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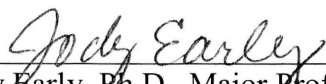
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To the Dean of the Graduate School:


I am submitting herewith a dissertation written by Fatemeh Youssefi entitled "Factors Predictive of Colorectal Cancer Screening Among Muslim Men and Women From Central/Middle Eastern Countries Living in North Texas." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Health Studies.

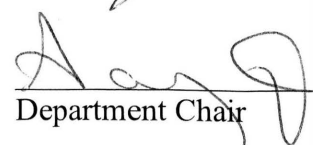


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We have read this dissertation and recommend its acceptance:







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Accepted:



Dean of the Graduate School

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DEDICATION

This dissertation is dedicated to my parents
for inspiring me throughout my life to achieve my goals
and to Asghar, Maryam, Reihaneh, and Ali for their constant support.

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I would like to express my deepest gratitude to Dr. Jody Oomen-Early for her constant patience, and guidance throughout this project. I would also like to thank Dr. René M. Paulson for her encouragement and valuable expertise. I am grateful to my committee members, Dr. Shipley, Dr. Cardenas, and Dr. James for their time and direction.

I would like to acknowledge my dear friend, Ron Kemp, for his expert comments on colorectal cancer screening. This dissertation would not be completed without help of Muslim individuals who have volunteered in this project.

Last but not least, I would like to thank my husband and children for their continuous love and patience.

ABSTRACT

FATEMEH YOUSEFFI

FACTORS PREDICTIVE OF COLORECTAL CANCER SCREENING AMONG MUSLIM MEN AND WOMEN FROM CENTRAL/MIDDLE EASTERN COUNTRIES LIVING IN NORTH TEXAS

MAY 2009

Colorectal cancer is known to be among the most common malignancies globally (Fazeli et al., 2007). Due to the high volume of Central/Middle Eastern Muslim immigration to the United States and the large population in North Texas, a need was recognized for health educators and health professionals to provide culturally competent care. Knowledge, attitude, belief, and self-efficacy as well as screening practices of this ethnic group were identified as the foundation for this study. This study measured subjective issues that have direct impact on adherence to the American Cancer Society guidelines in regard to colorectal cancer screening. Furthermore, this study served as a needs assessment for the development of culturally relevant CRC screening among Central/Middle Eastern population living in United States. The overall summary revealed that the participants who were knowledgeable about the colorectal cancer and associated procedures demonstrated more willingness to comply with screening procedures. Additionally, participants with higher self-efficacy scores evidenced more willingness to be screened for colorectal cancer and participants with higher belief scores were also

more willing to be screened for colorectal cancer. The key finding in this study surrounded respondents' income level specifically, those who had higher levels of income were more willing to be screened for colorectal cancer.

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CHAPTER I

INTRODUCTION

The second leading cause of cancer death in the United States is colorectal cancer (Centers for Disease Control and Prevention [CDC], 2007; Menon, Belue, Skinner, Rathwell, & Champion, 2007). This disease is a leading killer for both men and women. Colorectal cancer (CRC) is considered the third most common cancer in both men and women in the United States. (CDC, 2007). The American Cancer Society projects that there will be approximately 108,070 new cases of colon cancer and 40,740 new cases of rectal cancer by the end of 2008 (ACS Cancer Statistic, 2008). Furthermore, colorectal carcinoma is the most commonly diagnosed malignancy worldwide (Fazeli, Ghavami, & Lebaschi, 2007).

One etiological factor with which CRC is associated is age (ACS, 2008). The United States is on the edge of an aging revolution. The number of Americans ages 65 and over is expected to double by the year 2030 (Kurtin, 2007). This growing number of older adults places a burden on the public health system and even more strain on medical and social services (Kurtin).

In addition to the increasing number of adults aged 65 and older, the United States is becoming more diverse in its ethnic populations. The Department of Immigration and Naturalization (INS) reports that approximately 200,000 immigrants over 50 years of age will immigrate to United States by the end of 2008 (INS, 2008). An increasing diversity

in the United States' demographics and population dictates a need for detailed health education tailored to these ethnicities. Healthcare professionals and health educators are confronted with cultural issues from an ethnically diverse population as the result of increased immigrants to the United States. Therefore, it is imperative that these professionals be able to comprehend the beliefs of a Muslim population from Central/Middle Eastern countries. This religious belief system must be understood from a grassroots level in order to provide a culturally comprehensive program. Lack of research exists in applying a cultural model to the Central/Middle Eastern Muslim population in North Texas.

The PEN-3 model (Airhihenbuwa 1995; Airhihenbuwa & Webster, 2004) has been used in health education and public health to address health issues from a cultural framework. The PEN-3 was designed to incorporate cultural values and practices of a specific population as part of the program planning process. Although the PEN-3 has been used to address a variety of health issues from HIV/AIDS to breast cancer, there is a paucity of published research applying the model to the issue of colorectal cancer (Airhihenbuwa, 1995; Airhihenbuwa & Webster, 2004; Kline, 2007).

Purpose of the Study

The primary purpose of this study was to assess the factors which predict colorectal screening among Muslim adults ages 50 years and older who immigrated to North Texas from Central/Middle Eastern countries. This study also assessed the knowledge, attitudes, and beliefs about CRC among this group as well as measured their

level of self-efficacy as it relates to CRC prevention and risk reduction. Finally, the cultural factors that promote or deter from CRC screening were assessed, and suggestions for culturally competent health education programs for this group were provided.

Theoretical Framework

Three theories and/or constructs guided the study: the PEN-3 model, (Airhihenbuwa, 1995; Airhihenbuwa & Webster, 2004); Albert Bandura's construct of self-efficacy from the Social Learning Theory (Bandura, 1977, 1994), and cultural constructivism (Hutchinson, 2006). Constructs of self-efficacy and Cultural Constructivism were incorporated into the survey's questions. The PEN-3 Model also served as a framework for analyzing the focus group's questions.

Research Hypotheses

H1: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of knowledge about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.

H2: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of attitudes about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.

H3: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of beliefs about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.

H4: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of screening behavior among Central/Middle Eastern Muslim men and women immigrants in North Texas.

Research Questions

1. How does *cultural identity* impact adult Central/Middle Eastern Muslim men and women's colorectal screening behavior?
2. How do factors relating to *cultural empowerment* impact adult Central/Middle Eastern Muslim men and women's colorectal screening behavior?
3. How do *familial and social relationships* among Central/Middle Eastern Muslim men and women impact their colorectal screening behavior?

Study Variables

Dependent variables were knowledge, attitudes, beliefs, and screening behaviors. Independent variables were self-efficacy, gender, education, income and acculturation.

Delimitations

This descriptive study had the following delimitations:

1. The selected sample was comprised of adult men and women who are of the Muslim faith in North Texas.
2. The adults in this sample immigrated to the United States from Central/Middle Eastern countries.
3. Only those 50 years of age or older were included in the study.

4. Only those able to read and write in English were included in the study.
5. Only those who agreed to be audiotaped were included in the focus group.

Limitations

This descriptive study had the following limitations:

1. The samples for this study were volunteers.
2. The sample was a convenience sample. Therefore, results of this study cannot be generalized to the entire population of adult Muslim male and female immigrants from Central/Middle Eastern countries residing in the United States.
3. Responses to the questionnaires and focus group were self-reported.

Assumptions

Participants responded honestly to the questionnaires as well as constructive focus group participation.

Definition of Terms

Acculturation- The process whereby one whose learning was in one culture and then adopts attitudes, values, and behaviors of another culture (Shah, Zhu, & Potter, 2006).

Attitudes- “A hypothetical construct that represents an individual's like or dislike for an item. It could be positive, negative, or neutral” (Fishbein & Ajzen, 1975).

Beliefs- “The subjective probability of relation between the object of the belief and some other object, value, concept, or attribute” (Fishbein & Ajzen, 1975).

Central/Middle Eastern- Central and Middle Eastern part of Asia [such as] including

Arab countries as well as Turkey, Iran, Pakistan, Afghanistan, India, and Russia.

Colorectal Cancer- Disease of which malignant (cancer) cells form in the tissue of the colon or the rectum (NCI, 2008).

Colonoscopy- A procedure that requires a specialized physician to examine the colon for cancerous or noncancerous growths or abnormalities (NCI, 2008).

Cultural empowerment (from PEN-3) - Confirmation that a cultural belief has embedded practices that range from positive to negative (Airhihenbuwa, 1995).

Cultural Identity (from PEN-3) - Refers to the target population that may include the person, extended family, or neighborhood (Airhihenbuwa, 1995).

Immigrant-ation- The movement of people among countries for the purpose of living and not tourism (INS, 2008).

Knowledge- Expertise which is acquired by experience or education.

Muslim- A person who practices Islam.

Screening- Checking or evaluating for a disease when there are no symptoms (NCI, 2008).

Significance of the Study

Colorectal cancer is known to be among the most common malignancies globally (Fazeli et al., 2007). Due to the high volume of Central/Middle Eastern Muslim immigration to the United States and the large population in North Texas, a need was recognized for health educators and health professionals to provide culturally competent

care. Knowledge, attitude, belief, and self-efficacy as well as screening practices of this ethnic group were identified as the foundation for this study.

A direct correlation exists between the overall survival rate from colorectal cancer and early detection (McAlearney et al., 2007). Therefore, early detection provides a substantial decrease in mortality rate (NCI, 2008). This study measured subjective issues that have direct impact on adherence to the American Cancer Society's guidelines in regard to colorectal cancer screening. Furthermore, this study served as a needs assessment for the development of culturally relevant CRC screening among Central/Middle Eastern population living in United States.

CHAPTER II

LITERATURE REVIEW

The second leading cause of cancer-related deaths in the United States is colorectal cancer (CDC, 2007; Menon, Belue, Skinner, Rathwell, & Champion, 2007). Colorectal cancer (CRC) is a disease that refers to a type of cancer developing in portions of the digestive system, colon, or the rectum. Polyps developing in the lining of the colon or rectum can convert to a cancer known as colorectal cancer (ACS, 2007). Colorectal cancer (CRC) is considered the third most common cancer in men and women in the United States (CDC).

The National Cancer Institute (NCI) reports approximately 41,400 new cases of rectal cancers and approximately 112,300 new cases of colon cancers each year. The reported numbers of deaths are approximately 52,000, which include both colon and rectal cancers (NCI, 2008). From the spectrum of cancers, colorectal cancer remains the malignancy having a comparable incidence in both males and females (Gipsh, Sullivan & Dietz, 2004). The American Cancer Society projected that by end of 2008, there had been 108,070 new cases of colon cancer and 40,740 new cases of rectal cancer (ACS Cancer Statistic, 2008). In 2007, mortality statistics were reported as 26,000 deaths per 100,000 for men and 26,180 per 100,000 for women (NCI).

Lung cancer remains number one in cancer-related deaths in both genders. Prostate cancer is the second leading cause of cancer-related deaths among men, as

exhibited by Figure 1, and breast cancer is the second leading cause of cancer-related deaths among females, as illustrated in Figure 2.

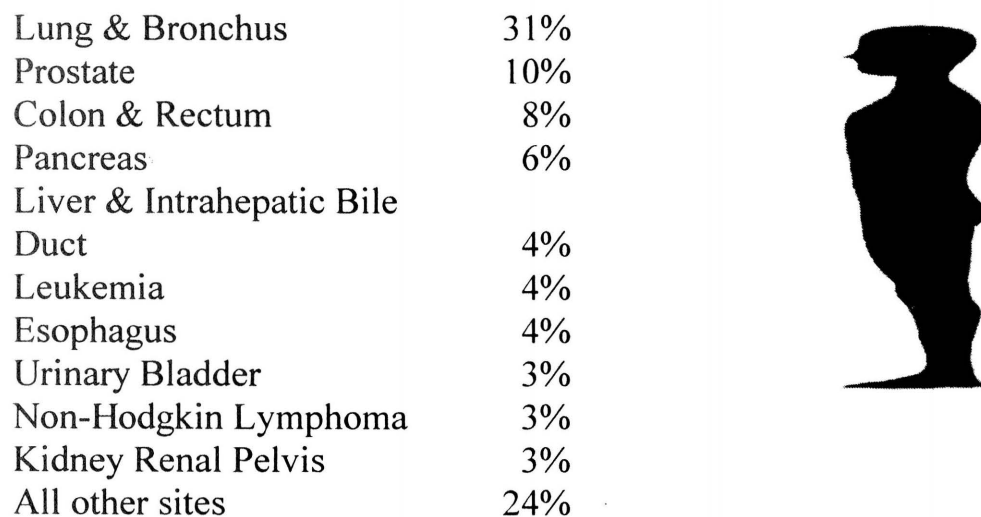


Figure 1. 2008 estimated cancers in men, Source: American Cancer Society, 2008

Furthermore, colorectal carcinoma is the most commonly diagnosed malignancy globally (Fazeli, Ghavami & Lebashci, 2007). More than one million people have been diagnosed with CRC globally (Kamangar, Dores, & Anderson, 2006). Annually, approximately 900,000 new cases of colorectal cancers are diagnosed worldwide, with an estimated 500,000 deaths from this disease (Benson et al., 2007).

Lung & Bronchus	26%
Breast	15%
Colon & Rectum	9%
Pancreas	6%
Ovary	6%
Non-Hodgkin Lymphoma	3%
Leukemia	3%
Uterine Corpus	3%
Liver & Intrahepatic Bile Duct	2%
Brain/ONS	2%
All other sites	25%



Figure 2. 2008 Estimated Cancers in Women Source: American Cancer Society, 2008
ONS = other nervous system

Risk Factors

Colorectal cancer is also considered a multifaceted disease; it is influenced by a number of factors including genetics, environment, and age. It is important for health educators, healthcare workers, and policy makers to understand the contributing factors to colorectal cancer, which include biological and cultural influences, so they can formulate effective preventative strategies and services (Moshkowitz & Arber, 2005). It is beneficial for healthcare professionals to recognize populations that have a higher risk of CRC, as defined by the National Cancer Institute and American Cancer Society. Risk factors common across all groups include age; family history of colon or rectal cancer;

history of polyps in the colon. Modifiable factors such as physical activity, dietary habits, and alcohol/tobacco use are identified as common across all groups.

Age

One major factor in the development of CRC is age. The United States is on the edge of an aging revolution. The number of Americans ages 65 and over is expected to double by year 2030 (Kurtin, 2007). This growing number of older adults places a burden on the public health system and even more strain on medical and social services (Kurtin). The National Cancer Institute reports that approximately \$8.4 billion dollars are spent annually in the United States for treatment of colorectal cancer. The median age at time of diagnosis for colorectal cancer was 71 years of age from 2001-2005, and the median age at death for colorectal cancer was reported as 75 years of age (NCI, 2008).

In addition to the increasing number of adults aged 65 and older, the U.S. population is changing in other ways; it is becoming more diverse. The Department of Immigration and Naturalization reports that approximately 200,000 immigrants over the age of 50 will immigrate to United States by the end of 2008 (INS, 2008). Included in this report is an increasing subset of the population who come from Central and Middle Eastern countries including Afghanistan, Azarbijan and Gulf countries such as Iran, Iraq, Turkey and others. More than 500,000 people migrated to United States from Central/Middle Eastern countries between the years 1997-2007 (INS).

Like the millions of graying adults in the general population of the United States, these immigrants are also reaching the autumns of their lives as well. As the number of

aging immigrants from Central/Middle Eastern countries increases throughout the United States, it is important for health educators and healthcare professionals to address the health needs of these immigrants in order to provide more effective prevention and treatment. This requires a culturally based assessment and planning model.

Incidences

In the United States, CRC incidence rates decreased by 2.2% between 1998 and 2002. However, incidence rates have not declined throughout all races; African Americans still have highest rate of incidence of CRC across all races in the United States (see Table 1).

Table 1

Incidence Rates by Race

Race/Ethnicity	Male	Female
All Races	59.2 per 100,000 men	43.8 per 100,000 women
White	58.9 per 100,000 men	43.2 per 100,000 women
Black	71.2 per 100,000 men	54.5 per 100,000 women
Asian/Pacific Islander	48.0 per 100,000 men	35.4 per 100,000 women
American Indian/Alaska Native	46.0 per 100,000 men	41.2 per 100,000 women
Hispanic	47.3 per 100,000 men	32.8 per 100,000 women

Source: Surveillance Epidemiology and End Results, 2008

Fatality rates also remain unequal across various ethnicities. Again African Americans have higher mortality rates when compared to other races (Lawsin, Duhamel, Weiss, Rakowski, & Jandorf, 2006). African American females reported the lowest levels of CRC screening, which can be the contributing factor in highest rate of mortality (Janz, Wren, Schottenfeld, & Gruite, 2003). The American Cancer Society validates the high incidence and death rates from CRC in African Americans, but the reason for these rates still remains unknown (ACS, 2008; see Table 2). McAlearney et al. (2007) suggest that the role of race and socioeconomic status may impact the disparity of mortality rates in colorectal cancer.

Table 2

Death Rates by Race

Race/Ethnicity	Male	Female
All Races	22.7 per 100,000 men	15.9 per 100,000 women
White	22.1 per 100,000 men	15.3 per 100,000 women
Black	31.8 per 100,000 men	22.4 per 100,000 women
Asian/Pacific Islander	14.4 per 100,000 men	10.2 per 100,000 women
American	20.5 per 100,000 men	14.2 per 100,000 women
Hispanic	16.5 per 100,000 men	10.8 per 100,000 women

Source: Surveillance Epidemiology and End Results, 2008

Recent studies show that Central/Middle Eastern populations have lower incidences of colorectal cancer as well as lower mortality rates (cancer.gov, 2007). International studies such as Fazeli et al. (2007) showed that the incidence of CRC ranks from low incidence from areas in Asian and African, to higher incident rates in Northern Europe and the United States. Worldwide, the age-standardized incident rate (ASR) of CRC is 20.2 per 100,000 males and 14.6 per 100,000 females. The study which was published by NCI indicates that ASR in developed countries is 40.0 per 100,000 males and 26.6 per 100,000 females. In less developed areas, the ASR is 10.2 per 100,000 males and 7.7 per 100,000 females. Across the spectrum, ASRs in males is highest in Australia/New Zealand, North America, and Western Europe, while South-Central Asia and Central Africa are at the lower end on the spectrum of incidences (cancer.gov).

Recently, there has been a significant increase in colorectal cancer incidence in Asian countries for unknown reasons (Ng, Tan, Teo, Seah, & Phua, 2007). Sung, Laua, Goh, and Leung (2005) report that the Chinese population has a higher risk of occurrence of CRC compared to other Asian ethnic groups. Ng et al. (2007) suggest that the increased incidence of colorectal cancer may have direct correlation with cultural beliefs, which impact their adherence to health-seeking behavior.

Genetics / Inheritance

Even though most colorectal cancers develop in people without a family history of colorectal cancer, the individuals with a family history of colorectal cancer are considered at high risk for the disease (ACS, 2008). Approximately 15% of people with

colorectal cancer have familial disease, and about 5 % of the individuals who develop colorectal cancer have an inherited genetic susceptibility to the disease (ACS).

Occurrences of CRC in a first-degree relative younger than age 60, or in 2 or more first-degree relatives, are also considered risk factors. These factors are global across every ethnicity (ACS). First-degree relatives are parents, brothers, sisters, or children of an individual (ACS).

One factor influencing the etiology of CRC is the genetic change in the epithelial cells of the colonic mucosa. Individuals who experience inflammatory bowel disease, Crohn's disease, or ulcerative colitis, have a genetic predisposition for development of CRC (cancer.gov, 2008). Also, Jews of Eastern European descent (Ashkenazi Jews) have high incidence of CRC (ACS, 2008). Several genetic mutations are thought to be the risk factor of this population.

Environment/ Acculturation

Polek et al. (2004) reported a lower incidence of breast cancer in Asian women than in western countries. However, because immigrants live longer in the western countries, especially the United States, the risk of developing cancer may become as comparable to the risk of American-born women. The increase of other cancers such as prostate cancer is also seen in various ethnic populations in the United States who immigrated from Asian and Eastern countries. Yavari et al. (2006) reported incidences of cancer in Iran versus cancers diagnosed among Iranian immigrants to Canada. Cancer

rates of the immigrant group were significantly higher than those living in Iran (Javari et al., 2006).

Other recent studies also show that Central/Middle Eastern populations have lower incidence and mortality rates from colorectal cancer and that the adaptation of Western habits such as diet may lead to higher incidence of the disease (Menon et al., 2007; Moshkowitz & Arber 2006; Wee, McCarthy & Phillips, 2005). Culturally, Central/Middle Eastern populations ascribe to dietary practices that have minimum consumption of red meat but a large intake of vegetables (cancer.gov, 2007).

It is also common among Central and Middle Eastern countries to engage in regular daily physical activities including walking since people do not always have access to vehicles or public transportation. One can ascertain from these factors that acculturation may have a positive or negative impact in regard to CRC incidence.

When discussing the increase rate of CRC due to modification of dietary and physical activity within Central and Middle Eastern immigrants, acculturation has been shown to have a negative impact on the immigrants who have adapted to the behavior of the migrated culture (Yavari et al., 2006). Therefore, native Central/Middle Eastern populations are at low risk of developing colorectal cancer due to low-fat diets and regular physical activity, which is parallel with ACS recommendations as preventive measures for colorectal cancer. However, when discussing the access to care, which means adherence to colorectal cancer screening, then acculturation is also a positive

process (Shah, Zhu & Potter, 2006). Some immigrants also can access health care due to higher income or educational level (Chen & Yamada, 2006).

Colorectal Cancer Screening

The Centers for Disease Control reports that CRC screenings save lives (CDC, 2007). There have been reports of a decrease in the number of deaths from CRC due to removal of polyps in the early stages. Since early detection of CRC has a significant impact on overall survival rate, CRC screening plays a vital important role in identifying early stages of CRC (CDC).

Survival from CRC is directly related to detection of cancer at an early stage; therefore, diagnosis of CRC at later stages will result in lower chances of survival. Studies conducted by the ACS, NCI, and CDC suggest that one of the important preventive measures against development of colorectal cancer is regular screening and testing. (McAlearney et al., 2007; Menon et al., 2007) The recent decline in the number of deaths from CRC is reportedly due to early detection of cancer (McAlearney et al.; Smith, Cookindies & Eyre 2006).

The ACS recommendations for colorectal cancer screening for the general public with no identifiable risk except age are as follows:

1. Begin screening at age 50
2. Annual Fecal Blood Test (FOBT)
3. Flexible sigmoidoscopy every 5 years
4. Colonoscopy every 10 years

Annual fecal blood tests check for hidden blood in fecal material (stool) due to polyps or cancers. NCI (2008) reports that this test may decrease the number of deaths by 15 to 33 percent when performed annually or every 2 years. Flexible sigmoidoscopy is a procedure that detects precancerous or cancerous growth by inserting a lighted flexible tube in the rectum and lower colon. This procedure can be used for removal and/or for biopsy of these growths in the rectum and lower colon. NCI suggests regular screening with sigmoidoscopy decreases number of deaths from colorectal cancer for people of 50 and over.

Colonoscopy refers to an examination of the entire colon also using a lighted instrument. During the examination, any precancerous or cancerous growth can be removed or biopsied including the upper portion of the colon (NCI, 2008). Both sigmoidoscopy and colonoscopy require cleansing the colon prior to the exam to ensure a clear colon for the examination with the lighted instrument. Therefore, the patient must be sedated during the procedure and provided with detailed patient education prior, during and post examination.

For some individuals, the cost of the procedure along with the level of insurance reimbursement is of high concern. Patient education, anxiety associated with the test, and patient cost pose barriers to compliance with recommended procedures (Lawsin et al., 2006). Review of the literature suggests that lack of recommendation by a primary care provider for these tests also has impact on patient compliance or awareness. Klabunde et al. (2005) report that, in their extensive study of over 1000 participants, only 10%

identified anxiety and cost as the barriers to screening. The majority of patients identified a lack of recommendation by their primary care physicians for colorectal cancer screening as the factor of not having the colorectal cancer screening done (Klabunde et al.).

Predictive Factors

Many immigrant individuals are part of the mainstream society. Necessary factors in adhering to ACS colorectal cancer screening guidelines are knowledge, attitudes, beliefs, screening behaviors, and self-efficacy. Despite numerous studies, lack of assessment of these predictive factors in Muslim population from Central/Middle Eastern exists. Therefore, health educators and healthcare professionals remain challenged to formulate comprehensive culturally competent programs. These factors are summarized as the individual's capability to make decisions, also referred to as self-efficacy. Additional factors are differences of gender role, education levels, income levels, and finally, the length of residency in this society.

Lack of knowledge and negative attitudes toward available screening tests may result in poor participation in screening guidelines (Wolf et al., 2005). Knowledge is defined as certain expertise that is acquired by experience or education. Therefore, health educators must assess the level of expertise, which is required for one to understand the importance of colorectal cancer screening. Another factor relating to the screening guidelines is attitude, which is a hypothetical construct that symbolizes an individual's preference to an item (Fishbein & Ajzen, 1975). Identifying attitudinal barriers will allow

a health educator to address the issues at the root. Also, understanding Central/Middle Eastern beliefs toward ACS guidelines will assist health educators with the awareness program.

Conceptual Framework

Historically, the interventions used to address health issues in various cultures were developed based on Western cultures and values. This thought process focused more so on the individual health practices. As the result of utilizing Western values for interventions, the issue of embedded cultural health practice was overlooked, and strategies failed to achieve maximum results in addressing the health behaviors.

Collins Airhihenbuwa first used the PEN-3 model in 1989 to assess cultural influences on health behavior and program planning (Airhihenbuwa & Webster, 2004). Developed to identify health practices within a specific culture, it has been used in health education and public health to address health issues from a cultural framework. The PEN-3 was designed to incorporate cultural values and practices of a specific population as part of the program planning. One of the areas in which PEN-3 is a successful cultural model is the emphasis on collective health behavior rather than individual behavior. (Airhihenbuwa 1995; Airhihenbuwa & Webster, 2004).

This conceptual model was developed by Collins Airhihenbuwa in 1989 and was initially comprised of three interrelated dimensions: health education, cultural appropriateness of health behavior, and educational diagnosis of health behavior (Airhihenbuwa & Webster, 2004). Even though the constructs of each dimension remains

the same, in 2004, Airhihenbuwa modified the domains to cultural identity, relationships and expectations, and cultural empowerment. Each domain contains three independent components that formulate the acronym PEN. These independent components are: Person, Extended family, and Neighborhood for cultural identity; Perceptions, Enablers, and Nurturers for relationships and expectations; Positive, Existential, and Negative for cultural empowerment.

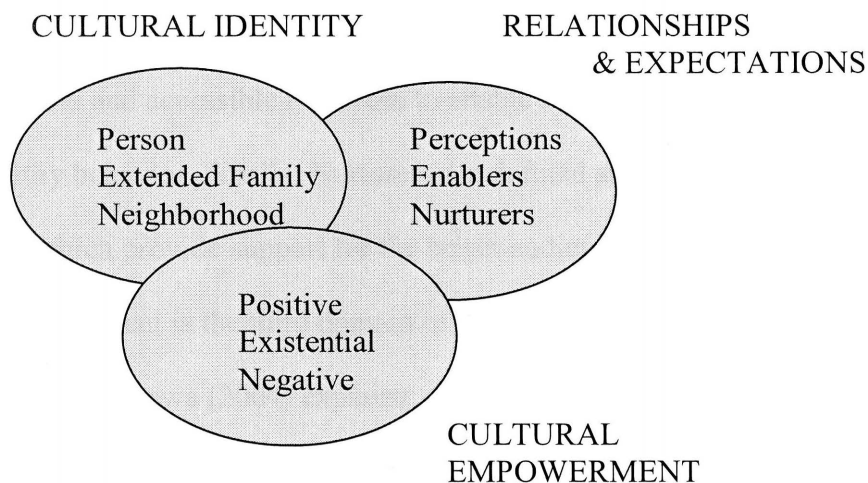


Figure 3. The PEN - 3 Model. Source: Airhihenbuwa & Webster (2004).

An elaboration of each domain provides the rationale in relating the reasoning regarding the successful consideration of the model in addressing the cultural health behavior. Cultural identity defines target population, person, extended family, and neighborhood. The Person aspect focuses on the individual empowerment to consider healthy decisions. The Extended family concentrates on the whole spectrum of the family

unit to obtain and understand healthy behavior. The Neighborhood is to seek community approval and acceptance of positive health behavior, and seek their assistance to change the negative health behavior toward the positive.

The second domain of PEN-3 is relationships and expectations, and the notion of this domain is to assess community Perception, Enablers, and Nurturers. Constructs of this domain are derived from PRECEDE/PROCEED, Health Belief Model, and the Theory of Reasoned Action. The Perceptions include knowledge, attitudes, and beliefs, and these perceptions are factors which inhibit or promote health behavior. The Enablers include available and accessible resources to enable the individual or target audience to achieve healthy behavior. Finally, Nurturers are defined as family, religious leaders, or gate-keepers which provide support for the target audience health behavior.

Cultural empowerment is the third domain of the PEN-3 model.

As Airhihenbuwa (2004) explains, culture and empowerment are historically never used in the same context, as society interprets empowerment as strength, and culture as a hindrance. The aim of this domain is to ensure that strategies which are used in health planning not only impact the bad practices, but also promote positive behavior. Positive cultural influences must be incorporated in health education programs. Existential cultural influences are practices that pose no threat to health behaviors, but negative cultural influences that pose as barriers toward achievement of healthy behaviors.

PEN-3 Model has been applied in various health issues as a conceptual framework, such as HIV/AIDS with the African population. A study by Abernethy et al. (2005) examines factors related to prostate cancer screenings of African American men. Another study conducted by Airhihenbuwa & Webster (2004) extensively studied the role of culture in Africa when dealing with HIV/AIDS. They found that the extended family and community have strong impacts on the individual's sexual behavior. The study determined that an assessment and formulation of a successful HIV/AIDS program in Africa depends strongly on the cultural aspect of sexual attitudes and behaviors. The model has also been applied to recruiting Hawaiian women for mammograms for early detection of breast cancer (Ka'opua, 2008).

Abernethy et al. (2005) discussed cultural and psychosocial factors that promote or deter African American men in regard to prostate cancer screening. Despite impressive evidence of prostate cancer in African American population, barriers to screening still remain high amongst this population. These barriers could be associated with the population's cultural factors which are related to knowledge, religious beliefs, and fear.

The PEN-3 Model was also used in a breast cancer screening promotion with Hawaiian women, identifying negative attitudes towards mammograms (Ka'opua, 2008). The goal of this study was to assess the impact of culture on behavioral factors that influenced adherence to mammogram screenings. Although the PEN-3 has been used to address a variety of health issues from HIV/AIDS to breast cancer (Airhihenbuwa, 1995,

Airhihenbuwa & Webster, 2004; Kline, 2007), there is a paucity of published research applying the model to the issue of colorectal cancer.

The model provides a comprehensive framework to assess socio-cultural norms and practices. The framework is in regard to gender roles, attitudes, decision-making, and health behavior among adult Central/Middle Eastern Muslim men and women living in North Texas.

In addition to PEN-3 Model, the Cultural Constructivism also guided this study. The concept of cultural constructivism is a derivative of Social Constructivism. The term constructivism refers to a notion that the learning process is based on an individual's perceptions and is formed when interacting with others. Therefore, learning is not only an individual process by which knowledge is gained, but it is a more collective process involving interaction with others (Lewin, 2000). The theory of cultural constructivism considers the embedded culture within each individual (Hutchison, 2006).

Finally, the construct of self-efficacy was used in this study as well. According to Bandura (1977, 1994), one's self-efficacy influences how he/she feels about his/her ability to act. Put another way, self-efficacy is the individual's perceived ability to perform based on experience extracted from previous situations or circumstances (Green & Kreutzer, 1991). Therefore, one needs to evaluate the capability of these individuals as how they encounter challenges when approaching various tasks (Bandura, 1994).

Summary

Age; family history of colorectal cancer; history of other cancers, especially those in the ovaries and breast; and a history of polyps in the colon are all risk factors impacting the contraction of the disease. As stated, age is one of the risk factors which has been identified as an important, non-modifiable risk factor for development of colorectal cancer.

As more Muslim men and women immigrants in North Texas approach the prime of their lives, they require further education in order to comply with American Cancer Society screening guidelines. Historically, the population from Middle/Central Eastern countries has low incidences of this disease; however, as these individuals live longer in this society, the rate becomes comparable with the mainstream population. Therefore, health educators and healthcare professionals need to recognize the underlying reasons for barriers to the screening guidelines.

The rate of colorectal cancer incidence has decreased throughout the years, and this great milestone is directly related to detecting colorectal cancer in the early stage (NCI, 2008). The overall survival depends directly on new developments and compliance with colorectal cancer screening. The American Cancer Society encourages everyone at age 50 to have the Annual Fecal Blood Test (FOBT), undergo a flexible sigmoidoscopy procedure every five years, and a colonoscopy procedure every ten years.

By examining the predictive factors that promote or deter adherences to these guidelines and analyzing cultural perceptions by way of the PEN-3 model, health

educators and other healthcare professionals can formulate comprehensive relative programs. Scholars have proposed that research is needed to ascertain the factors effecting health practices. These practices impact early cancer detection among individuals from various ethnic groups. Health educators in concert with other healthcare professionals are charged with the responsibility of identifying cultural implications of early detection within different ethnic groups (Azaiza & Cohen, 2008).

CHAPTER III

METHODOLOGY

The following chapter describes the methodology, sampling procedures, data collection, and instrumentation utilized in this study.

Procedure

This mixed-method study used both quantitative and qualitative methods. A closed-ended survey was used to assess the participants' knowledge, attitudes, beliefs, and screening behaviors. Focus groups were used to determine factors that promote or deter individuals from CRC screening. These focus groups received questions based on the PEN-3 and examined the extent to which cultural identity, relationships and expectations, and cultural empowerment influence knowledge, attitudes, beliefs, and screening behavior among this group.

Sampling Procedures for Quantitative Survey

The study used a purposeful convenience sample comprised of volunteers from four Islamic/Cultural Centers in North Texas. These centers were selected due to the high attendance rate of Muslim people. Only participants aged 50 years and older who could read and write in English were asked to participate in the research, and only participants agreeing to be audiotaped were included in the focus groups.

The board of directors assisted the investigator with the recruitment of volunteers. The volunteers were notified and recruited for the study through advertisement by the

board of directors, verbal announcement (see Appendix A), as well as displaying of flyers (see Appendix B) at different Islamic/Cultural Centers' events. Participants had an option to complete the survey on site or return it at a different date. If the participant expressed the desire to complete the survey at a different time, he/she returned the survey to a collection receptacle located in the public lobby of the facility.

The survey cover letter contains the elements of informed consent (see Appendix C) and accompanied the survey (see Appendix D-F). The participant's completion of the survey signified his/her consent and the statement, "Completion of this survey will signify your informed consent to participate in this study," appeared on the survey that each participant submitted. Free refreshments were provided at the survey location as an incentive to participate in the research.

Sampling Procedures for Qualitative Focus Group

The researcher informed volunteers for the focus groups that they could complete the form on the reverse side of the invitation/flyer by providing a first name initial, their age, gender, and telephone or email contact information. The volunteer was requested to insert this form in the drop box located in the main lobby of the center. This occurred one week prior to the focus groups. The investigator then selected group volunteers according to their age and gender for a representative group. Chosen volunteers were contacted to confirm their ability to participate in the focus group on the assigned date. Two sessions consisting of six people were held in one of the centers where participants were asked the focus group questions.

Prior to beginning the focus groups, the researcher reviewed the focus group informed consent form (see Appendix G) with the participants and addressed any existing concerns. The participants' signatures were required on the informed consent forms, which were then returned to the researcher before beginning the discussion. Those who did not consent to the discussion were allowed to excuse themselves at any time.

Protection of Human Participants

Permission to conduct this study was obtained from the board members of the centers as well as the IRB at Texas Woman's University. The surveys and survey cover letter with elements of informed consent (see Appendix C) were available in the lobbies of the centers for participants to obtain, complete, and return to the same location. The surveys were anonymous and all data collected in the focus groups was reported collectively. No person's name was disclosed in the focus group; instead, participants were addressed by "Participant A, Participant B," etc. Those who chose to participate in the survey and/or focus group received a unique participant code.

Data Collection

Four Islamic/Cultural Centers were selected for their high Muslim attendance. From the initial phase of data collection, one of the centers was eliminated due to an historical event which had taken place, limiting the number of centers to three for data collection.

The data collection phase started December 14, 2008. Survey packets containing a survey consent form and a survey were placed in the lobbies of the centers. At each event

conducted by the centers, the event coordinator announced the availability of surveys in the lobby to the public.

At the Islamic Association of North Texas (IANT) center, 35 surveys were completed on site, and approximately 40 surveys were taken by volunteers to be completed and returned at a later time. However, only 5 surveys were returned later to the IANT center. At the Momin center, 47 surveys were completed on site, and 32 surveys were taken by volunteers to be completed at a later time. Six completed surveys were returned to the center. At the Towheed center, 23 surveys were completed on site, and 24 surveys were taken by volunteers to be completed at later time. Sixteen surveys were later returned to the center.

Focus group

Fifteen volunteers expressed the desire to participate in focus groups. These fifteen volunteers provided their phone numbers and/or email addresses as contact information. To ensure a true representation, twelve of these volunteers were selected for the two focus groups. Two sessions of focus groups were conducted at the Towheed center. One group consisted of six people, and was composed of two females and four males. A second focus group also consisted of six participants. This group was composed of three females and three male participants. The moderator of the focus group was the researcher, and assistants were recruited as scribes for the documentation of the discussion group.

Instrumentation

Three surveys were used in this study to assess knowledge, attitude, belief, self-efficacy, acculturation, and behavior. The participant's completion of the survey signified his/her consent to participate. The statement, "Completion of this survey will signify your informed consent to participant in this study," appeared on each survey.

Cancer Screening Survey (CSS)

The CSS was developed by the U.S. Department of Veteran's Affairs in 2005 to assess knowledge, attitudes, and beliefs regarding cancer screening. The instrument met the standard fifth-grade level of reading comprehension. Several studies showed that the CSS is valid and reliable, determined because the CSS measure of reliability spans from .73 to .59 per subscale measured (Wolf et al., 2005). Principal components (PC) analysis was applied to assess the construct validity of 16 items.

This particular instrument contained low values, reflecting high knowledge and attitudes regarding colorectal cancer screening. The knowledge scale measurement was dichotomous (1= yes, 2= no). The attitude scale measurement was scored from 1 to 3, with a "not worried" statement scored as 1, "somewhat worried" scored as 2, and "extremely worried" scored as 3. The belief scale measurement was "correct" or "incorrect".

For this research, after consulting a Texas Woman's University statistician, modifications were applied to the scoring and presentation of questions. The knowledge section of the survey was measured by asking five questions, each giving the respondents

the choice of three answers; “I know nothing,” “I know a little,” and “I know a lot.” The attitude section of the survey was measured by asking four questions, and respondents had the choice of three answers: “not worried,” “somehow worried,” and “extremely worried.” The belief section of the survey was measured by six questions, providing the respondents with the choice of five answers; “strongly disagree,” “disagree,” “no opinion,” “agree,” and “strongly agree.”

General Self-Efficacy (GSE)

The modification of the General Self-Efficacy (GSE) scale was used to measure self-efficacy (Schwarzer & Jerusalem, 1995). This survey was formed to predict one’s ability to cope with daily routine. The Cronbach’s alphas ranged from .76 to .90. The modified self-efficacy scale was based on four statements as well as four sub-type questions. Each item response was ranked by the participant as “not at all confident,” “somewhat confident,” “pretty confident,” “extremely confident,” and “no opinion.”

Demographic Profile/ Acculturation/ Behavior

The last page of the packet was the demographic profile. Participants were asked to self-report their gender, age, length of residency in the United States, level of education, and level of income. Also, they were asked if they had sought colorectal cancer screening in the past for ascertaining information in regard to health behavior. Participants’ responses to length of residency in the United States were used to determine the degree of acculturation (see Appendix F).

Qualitative Questions

In addition to the survey, seven open-ended questions based on the PEN-3 were used to guide the focus groups. The questions helped to determine how cultural identity, family and social relationship, and cultural empowerment impact colorectal cancer screening among the group under study (see Appendix H). Additional interview probes were provided to address the constructs of the model. The focus group size was based on literature that suggested small focus groups of 5-7 participants. These group sizes [would] captured the voice of each participant as well as provided effective open communication among participants. The researcher transcribed the audiotaped content of discussion group and used Hyper Transcribe 1.0 for data analysis.

Summary

This study used both quantitative and qualitative methods. A close-ended survey was used to assess the participants' knowledge, attitudes, beliefs, and screening behaviors. Focus groups were used to determine factors which promote or deter individuals from CRC screening. These focus groups received questions based on the PEN-3 and examined the extent to which cultural identity, relationships and expectations, and cultural empowerment influence knowledge, attitudes, beliefs and screening behavior among this group.

CHAPTER IV

RESULTS

The primary purpose of the present study was to assess the factors that predict colorectal cancer (CRC) screening among Muslim adults ages 50 years and older who immigrated to North Texas from Central/Middle Eastern countries. This study also assessed the knowledge, attitudes, and beliefs about CRC among this group, and measured their level of self-efficacy as it relates to CRC prevention and risk reduction. Finally, the cultural factors that promote or deter from CRC screening were also analyzed.

Descriptives

Demographics

A total of 126 Central and Eastern Muslim men and women were included in the current study. As shown in Table 3, a majority were male (69.8%) and less than half of the respondents were female (29.4%). A small proportion of participants were over 64 years of age (16.7%), 37.3% were 54 years or younger and 42.9% were between the years of 55 and 64 years old. As shown in Table 4, participants ranged in age from 42 to 75 years of age, with a mean of 57.85 years ($SD = 6.44$). A majority of respondents were Middle Eastern (62.7%) and less than half were Central Eastern (27.8%). Respondent income was grouped into one of three categories: less than \$30,000, \$45,001 to \$75,000,

and more than \$75,000. Of these, 35.7% of participants earned less than \$45,000, 26.2% earned between \$45,001 and \$75,000, and 33.3% earned more than \$75,000 each year.

Table 3

Frequencies and Percentages for Categorical Demographic Variables

	N	%
Gender		
Male	88	69.8
Female	37	29.4
Age		
54 Years or Less	47	37.3
55 to 64 Years	54	42.9
Over 64	21	16.7
Ethnicity		
Eastern Central	35	27.8
Eastern Middle	79	62.7
Income		
Less than 45,000	45	35.7
\$45,001 to \$75,000	33	26.2
More than \$75,000	42	33.3
Education		
High School and Below	28	22.2
Some College/Associate's Degree	24	19.0
Bachelor's Degree & Some Graduate Work	24	19.0
Master's Degree	31	24.6
PhD and Post Doctorate	18	14.3
Years Living in the United States		
15 Years or Less	28	22.2
16 to 25 Years	39	31.0
26 to 35 Years	41	32.5
36 Years or More	16	12.7

In terms of education level, participants were roughly equally divided across five categories: high school or below (22.2%), some college or associate's degree (19.0%), bachelor's degree and some graduate work (19.0%), master's degree (24.6%), and PhD or post doctorate degree (14.3%) (see Table 3). As part of the survey, respondents were asked to report the number of years that they had lived in the United States. The results revealed that 22.2% reported living in the United States for 15 years or less, 31.0% for 16 to 25 years, 32.5% for 26 to 35 years, and 12.7% had lived in the United States for 36 or more years. As shown in Table 4, respondents reported living in the United States for an average of 24.06 years ($SD = 10.74$), with a range from 2 to 50 years.

Table 4

Means and Standard Deviations for Continuous Demographic Variables

	N	Mean	SD	Min	Max
Age	122	57.85	6.44	42	75
Years Living in the United States	124	24.06	10.74	2	50

Knowledge

Participants were asked about their knowledge of colorectal cancer (see Table 5). When asked if they had heard of colorectal cancer, 31.0% reported that they knew nothing about that particular cancer, almost half reported knowing a little about colorectal

cancer (45.2%) and the remaining participants reported knowing a lot about colorectal cancer (27.0%). When asked if they had heard about colorectal cancer tests, nearly one-third of respondents said they knew nothing about the test (31.0%), 39.7% reported knowing a little about colorectal cancer tests, and the remaining respondents said they knew a lot about colorectal cancer tests (27.8%). Participants were also asked if they were familiar with a flexible sigmoidoscopy. Roughly half of the respondents reported knowing nothing about the procedure (47.6%), whereas one-fourth of respondents stated they knew a little about a flexible sigmoidoscopy (25.4%). Finally, 26.2% of participants reported that they knew a lot about flexible sigmoidoscopy.

Respondents were also asked if they were familiar with a fecal occult blood test. As shown in Table 5, nearly half of the respondents stated that they knew nothing about the procedure (48.4%). The remaining participants reported knowing a little about a fecal occult blood test (25.4%) or knowing a lot about the test (25.4%). When asked if they were familiar with the ideal testing age, 43.7% reporting knowing nothing of the ideal age, 32.5% stated they knew a little bit about the ideal testing age, and the remaining participants stated they knew a lot about the ideal testing age (23.0%). The five knowledge items were summed to achieve a single score. The average knowledge score was 9.29 ($SD = 3.40$) out of a possible 15, indicating that participants had a little knowledge about colorectal cancer.

Table 5

Frequencies and Percentages for Knowledge Items

	n	%
Have you heard of colorectal cancer?		
I know nothing	33	26.2
I know a little	57	45.2
I know a lot	34	27.0
Have you heard of tests for colorectal cancer?		
I know nothing	39	31.0
I know a little	50	39.7
I know a lot	35	27.8
Are you familiar with Flexible Sigmoidoscopy?		
I know nothing	60	47.6
I know a little	32	25.4
I know a lot	33	26.2
Are you familiar with Fecal Occult Blood Test?		
I know nothing	61	48.4
I know a little	32	25.4
I know a lot	32	25.4
Are you familiar with the ideal testing age?		
I know nothing	55	43.7
I know a little	41	32.5
I know a lot	29	23.0

Attitudes

Participants were also asked about their attitudes regarding test procedures. As shown in Table 6, only a small proportion of the participants reported that they were extremely worried that Flexible Sigmoidoscopy would be embarrassing (11.9%), whereas almost half of the participants reported that they were not worried about the procedure being embarrassing (46.0%) and the remaining participants stated that they were somewhat worried that the procedure would be embarrassing (41.3%). When asked if they were worried that Flexible Sigmoidoscopy would be painful, 46% of the participants stated that they were not worried that the procedure would be painful, 37.3% were somewhat worried, and the remaining participants were extremely worried (16.7%).

As shown in Table 6, when asked whether the Fecal Occult Blood Test would be embarrassing, nearly half of the participants reported that they were not worried (47.6%), approximately one-third were somewhat worried that the procedure would be embarrassing (36.5%), and the remaining participants stated that they were extremely worried that the procedure would be embarrassing (16.7%). When asked if they were worried that the procedure would be painful, 40.5% of participants stated that they were not worried that Fecal Occult Blood test would be painful and nearly one-third reported that they were somewhat worried (31.0%). The remaining participants reported that they were extremely worried that the procedure would be painful (12.7%). The four attitude items were summed to achieve a single score. The average attitude score was 6.43 ($SD =$

2.58) out of a possible 12, indicating that participants were not at all or somewhat worried about the pain and embarrassment associated with colorectal cancer procedures.

Table 6

Frequencies and Percentages for Attitude Items

	n	%
Would you be worried that FS would be embarrassing?		
Not worried	58	46
Somehow worried	52	41.3
Extremely worried	15	11.9
Would you be worried that FS would be painful?		
Not worried	57	45.2
Somehow worried	47	37.3
Extremely worried	21	16.7
Would you be worried that FS would be painful?		
Not worried	60	47.6
Somehow worried	46	36.5
Extremely worried	18	14.3
Would you be worried that FOBT would be painful?		
Not worried	51	40.5
Somehow worried	39	31
Extremely worried	16	12.7

Note: FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Screening Behavior

Participants were also asked whether they had ever seen a health care provider for a colorectal cancer (CRC) screening. As shown in Table 7, nearly two-thirds of the participants reported that they had not seen a health care provider for CRC screening (61.1%) and nearly 40% stated that they had seen a health care provider for a CRC screening (38.1%).

Table 7

Frequencies and Percentages for Attitude Items

	n	%
CRC Screening		
No	77	61.1
Yes	48	38.1

Note: CRC = Colorectal Cancer; Frequencies not summing to 126 and percentages not summing to 100, reflect missing data.

Using a scale from 1 to 5, participants rated how willing they were to be screened for colorectal cancer screening if they had not already been screened. As shown in Table 8, out of a possible five, respondents were, on average, somewhat willing to get screened ($M = 3.23$, $SD = 1.41$).

Table 8

Means and Standard Deviations for Willingness to be Screened

	N	Mean	SD	Min	Max
Willing to get screened	81	3.23	1.41	1	5

Self-Efficacy

Respondents were asked about their level of confidence in various activities related CRC screening and their level of confidence in the subsequent results, using a scale ranging from 1 (not at all confident) to 4 (very confident). As shown in Table 9, the average confidence rating for remembering to get a CRC screening was 2.75 ($SD = 0.98$), indicating that participants were somewhat to pretty confident in their ability to remember when to seek screening. Similarly, the average confidence rating for their ability to schedule a CRC screening was 2.79 ($SD = 0.94$), indicating that participants were somewhat to pretty confident in their ability to schedule appointments for screenings. The average rating for confidence in keeping their CRC screening appointments was 3.04 ($SD = 0.88$), indicating that participants were pretty confident in their ability to keep appointments for screenings. The average confidence rating about asking questions regarding changes in bowel habits was 2.91 ($SD = .92$), indicating that

participants were somewhat to pretty confident in their ability to ask questions about changes in their bowel habits.

Table 9

Means and Standard Deviations for the Self-Efficacy Items

	N	Mean	SD	Min	Max
I feel confident in my ability to:					
remember when to see CRC screening	102	2.75	0.98	1	4
schedule appointment for CRC screening	104	2.79	0.94	1	4
keep the appointment for CRC screening	105	3.04	0.88	1	4
ask questions about: a. changes in bowel habits	101	2.91	0.92	1	4
ask questions about: b. screening tests	100	2.88	0.94	1	4
ask questions about: c. results	98	2.97	0.95	1	4
talk about colorectal cancer to my health care provider	101	2.98	0.95	1	4

Note: CRC = Colorectal Cancer

The average rating for confidence in asking questions about screening tests was 2.88 ($SD = .94$), indicating that participants were somewhat to pretty confident in their

ability to ask questions about their tests (see Table 9). The average rating for confidence about questioning results was 2.97 ($SD = .95$), suggesting that participants were somewhat to pretty confident in their ability to ask questions about test results. Finally, the average rating for participant confidence in ability to talk about colorectal cancer with health care providers was 2.98 ($SD = .95$), indicating that participants felt pretty to somewhat confident in their ability to talk about colorectal cancer with their health care providers. The seven self-efficacy items were summed to achieve a single score. As shown in Table 10, the average self-efficacy score was 18.75 ($SD = 6.88$) out of a possible 35, indicating that participants were somewhat to pretty confident in their ability to schedule tests and to talk about their health concerns with their health care providers.

Table 10

Means and Standard Deviations for Attitude Total, Knowledge Total, Belief Total, Self-Efficacy Total

	N	Mean	SD	Min	Max
Attitude Total	125	6.43	2.58	2	12
Knowledge Total	125	9.29	3.40	5	15
Belief Total	124	22.65	4.55	6	30
Self-Efficacy Total	110	18.75	6.88	1	28

Belief

Respondents were asked about their beliefs about colorectal cancer, on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). As shown in Table 11, the average rating for the necessity of early diagnosis of colorectal cancer was 4.27 ($SD = .90$), indicating that participants agreed to strongly agreed about the necessity of early diagnosis of colorectal cancer. The average rating of knowing the survival rate of colorectal cancer with early detection was 3.72 ($SD = 1.01$), indicating that participants somewhat agreed that they knew the survival rate of colorectal cancer if caught early. The average rating of the seriousness of late diagnosis of colorectal cancer was 4.07 ($SD = 1.10$), indicating that participants agree on the seriousness of late diagnoses of colorectal cancer. The average rating of the chances of getting colorectal cancer was 3.37 ($SD = 1.06$), indicating that participants somewhat agreed about the chances of getting colorectal cancer.

The average rating of getting tested for fecal occult blood test if recommended by a friend was 3.69 ($SD = 1.07$), indicating that participants somewhat agreed that they would get a fecal blood test if recommended by a friend. The average rating of getting tested for flexible sigmoidoscopy if recommended by a friend was 3.71 ($SD = 1.07$), indicating that participants somewhat agreed that they would get a flexible sigmoidoscopy if recommended by a friend. The six belief items were summed, resulting in a single score reflecting participant beliefs about colorectal cancer. As shown in Table 10, the average belief score was 22.65 ($SD = 4.55$) out of a possible 30, indicating that

participants somewhat agreed about being tested for colorectal cancer, and the necessity of being diagnosing colorectal cancer early.

Table 11

Means and Standard Deviations for the Belief Items

	N	Mean	SD	Min	Max
Is it necessary to diagnose CRC early	124	4.27	0.90	1	5
I know the survival rate of CRC if found early:	121	3.72	1.01	1	5
It is serious to diagnose CRC late:	123	4.07	1.10	1	5
I know the chance of getting CRC:	122	3.37	1.06	1	5
I would get tested for FOBT if a friend recommended it.	124	3.69	1.07	1	5
I would get tested for FS if a friend recommended it.	124	3.71	1.07	1	5

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Relationships Among Independent Variables

Analyses were conducted to examine the relationships between the independent variables. More specifically, crosstab analysis using Pearson's chi-square and Cramer's V tests were conducted to examine the relationships between the categorical independent variables.

Gender

The relationships between gender and ethnicity, education, age, years living in the United States, income, the five knowledge items, four attitude items, and screening behavior are displayed in Table 12. There was a significant relationship between participant income levels and gender. In general, male respondents tended to earn more income per year than female respondents, $\chi^2(2) = 11.56, p < .05$, Cramer's $V = .31$. For example, more female respondents earned less than \$45,000 per year (60.0%) than male respondents (28.2%). A greater proportion of male respondents, however, earned an annual salary of \$45,001 to \$75,000 (29.4%) than female respondents (22.9%). Similarly, more males earned over \$75,000 per year (42.4%) than females (17.1%). There was also a significant relationship between education and gender, $\chi^2(4) = 10.37, p < .05$, Cramer's $V = .29$. In general, male respondents tended to have higher education levels than female respondents. For instance, more female respondents had only a high school education or less (37.8%) than male respondents (15.9%). A greater proportion of male respondents, on the other hand, had a bachelor's degree (21.6%) compared to females (13.5%). Similarly, more males had a master's degree (29.5%) compared to females (13.5%).

Table 12

Frequencies and Percentages for Ethnicity, Education, Age, Years in US, and Income by Gender

	Male		Female		χ^2	<i>p</i>
	n	%	n	%		
Ethnicity					1.66	.198
Eastern Central	21	26.9	14	38.9		
Eastern Middle	57	73.1	22	61.1		
Education					10.37	.035
High School and Below	14	15.9	14	37.8		
Some College/Associate's Degree	15	17.0	9	24.3		
Bachelor's Degree and Some Graduate Work	19	21.6	5	13.5		
Master's Degree	26	29.5	5	13.5		
PhD and Post Doctorate	14	15.9	4	10.8		
Age					1.16	.560
54 Years or Less	35	40.2	12	34.3		
55 to 64 Years	39	44.8	15	42.9		
Over 64	13	14.9	8	22.9		
Years in US					5.37	.146
15 Years or Less	16	18.4	12	32.4		
16 to 25 Years	26	29.9	13	35.1		
26 to 35 Years	31	35.6	10	27.0		
36 Years or More	14	16.1	2	5.4		
Income					11.56	.003
Less than \$45,000	24	28.2	21	60.0		
\$45,001 to \$75,000	25	29.4	8	22.9		
More than \$75,000	36	42.4	6	17.1		

The results failed to reveal significant relationships between gender and ethnicity, age, year living in the United States, the five knowledge items (see Table 13), and screening behavior (see Table 14), all *ns*. Additionally, there were no significant relationships between being worried about the embarrassment of a flexible sigmoidoscopy, the painfulness of a flexible sigmoidoscopy, and the painfulness of a fecal occult blood test, all *ns*.

There was a significant relationship between respondent attitude about the embarrassment of having a fecal occult blood test, $\chi^2(3) = 6.63, p < .05$, Cramer's $V = .16$ (see Table 14). Male respondents were more likely to report not being worried about a fecal occult blood test being embarrassing (54.7%) than female respondents (32.4%). Similarly, more female respondents reported being somewhat worried about a fecal occult blood test being embarrassing (54.1%) than male respondents (30.2%).

Ethnicity

The relationships between ethnicity and education, age, years living in the United States, income, the five knowledge items, four attitude items, and screening behavior are displayed in Table 15 - 17. There was a significant relationship between ethnicity and respondent worry about the painfulness of a fecal occult blood test, $\chi^2(2) = 6.45, p < .05$. Cramer's $V = .21$. In general, more Central Eastern respondents reported that they were worried about the painfulness of a fecal occult blood test than Middle Eastern respondents. For example, more Central Eastern respondents reported that they were somewhat worried about pain (50.0%) than Middle Eastern respondents (31.7%). More

Middle Eastern respondents, on the other hand, reported that they were not worried about the painfulness of a fecal occult blood test (55.6%) compared to Central Eastern respondents (28.1%).

Table 13

Frequencies and Percentages for the Five Knowledge Items by Gender

	Male		Female		χ^2	<i>p</i>
	n	%	n	%		
Have you heard of CRC?					.73	.694
I know nothing	25	29.1	8	21.6		
I know a little	38	44.2	18	48.6		
I know a lot	23	26.7	11	29.7		
Have you heard of tests for CRC?					2.14	.343
I know nothing	31	35.6	8	22.2		
I know a little	33	37.9	16	44.4		
I know a lot	23	26.4	12	33.3		
Are you familiar with FS?					1.25	.535
I know nothing	44	50.6	15	40.5		
I know a little	22	25.3	10	27.0		
I know a lot	21	24.1	12	32.4		
Are you familiar with FOBT?					3.25	.197
I know nothing	47	54.0	14	37.8		
I know a little	21	24.1	10	27.0		
I know a lot	19	21.8	13	35.1		
Are you familiar with the ideal testing age?					.04	.983
I know nothing	39	44.8	16	43.2		
I know a little	28	32.2	12	32.4		
I know a lot	20	23.0	9	24.3		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 14

Frequencies and Percentages for the Four Attitude Items and Screening Behavior by Gender

Would you be worried that:	Male		Female		χ^2	<i>p</i>
	n	%	n	%		
FS would be embarrassing?					3.27	.195
Not worried	44	50.6	13	35.1		
Somehow worried	32	36.8	20	54.1		
Extremely worried	11	12.6	4	10.8		
FS would be painful?					1.41	.495
Not worried	42	48.3	14	37.8		
Somehow worried	32	36.8	15	40.5		
Extremely worried	13	14.9	8	21.6		
FOBT would be embarrassing?					6.63	.036
Not worried	47	54.7	12	32.4		
Somehow worried	26	30.2	20	54.1		
Extremely worried	13	15.1	5	13.5		
FOBT would be painful?					3.36	.186
Not worried	39	54.2	12	35.3		
Somehow worried	23	31.9	16	47.1		
Extremely worried	10	13.9	6	17.6		
CRC Screening					.52	.470
No	56	63.6	21	56.8		
Yes	32	36.4	16	43.2		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 15

Frequencies and Percentages for Education, Age, Years in US, and Income by Ethnicity

	Eastern Central		Eastern Middle		χ^2	<i>p</i>
	n	%	n	%		
Education					1.51	.825
High School and Below	10	28.6	17	21.5		
Some College/Associate's Degree	6	17.1	16	20.3		
Bachelor's Degree and Some Graduate Work	7	20.0	12	15.2		
Master's Degree	8	22.9	21	26.6		
PhD and Post Doctorate	4	11.4	13	16.5		
Age					2.14	.342
54 Years or Less	16	47.1	26	33.8		
55 to 64 Years	12	35.3	38	49.4		
Over 64	6	17.6	13	16.9		
Years Living in the United States					3.54	.315
15 Years or Less	6	17.1	22	28.2		
16 to 25 Years	13	37.1	19	24.4		
26 to 35 Years	10	28.6	28	35.9		
36 Years or More	6	17.1	9	11.5		
Income					2.10	.350
Less than \$45,000	13	37.1	29	38.2		
\$45,001 to \$75,000	12	34.3	17	22.4		
More than \$75,000	10	28.6	30	39.5		

Table 16

Frequencies and Percentages for the Five Knowledge Items by Ethnicity

	Eastern Central		Eastern Middle		χ^2	<i>p</i>
	n	%	n	%		
Have you heard of CRC?					5.05	.080
I know nothing	4	11.4	24	31.2		
I know a little	20	57.1	33	42.9		
I know a lot	11	31.4	20	26.0		
Have you heard of tests for CRC?					2.86	.239
I know nothing	6	17.6	26	33.3		
I know a little	17	50.0	32	41.0		
I know a lot	11	32.4	20	25.6		
Are you familiar with FS?					.77	.680
I know nothing	14	40.0	38	48.7		
I know a little	11	31.4	20	25.6		
I know a lot	10	28.6	20	25.6		
Are you familiar with FBOT?					.30	.861
I know nothing	16	45.7	40	51.3		
I know a little	9	25.7	18	23.1		
I know a lot	10	28.6	20	25.6		
Are you familiar with the ideal testing age?					.34	.845
I know nothing	16	45.7	35	44.9		
I know a little	10	28.6	26	33.3		
I know a lot	9	25.7	17	21.8		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 17

Frequencies and Percentages for the Four Attitude Items and Screening Behavior by Ethnicity

Would you be worried that:	Eastern Central		Eastern Middle		χ^2	<i>p</i>
	n	%	n	%		
FS would be embarrassing?					3.41	.182
Not worried	11	31.4	39	50.0		
Somehow worried	18	51.4	30	38.5		
Extremely worried	6	17.1	9	11.5		
FS would be painful?					5.00	.082
Not worried	10	28.6	39	50.0		
Somehow worried	16	45.7	28	35.9		
Extremely worried	9	25.7	11	14.1		
FOBT would be embarrassing?					4.75	.093
Not worried	11	31.4	41	53.2		
Somehow worried	17	48.6	27	35.1		
Extremely worried	7	20.0	9	11.7		
FOBT would be painful?					6.45	.040
Not worried	9	28.1	35	55.6		
Somehow worried	16	50.0	20	31.7		
Extremely worried	7	21.9	8	12.7		
CRC Screening					2.12	.145
No	18	51.4	52	65.8		
Yes	17	48.6	27	34.2		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

There was a marginally significant relationship between ethnicity and having heard about colorectal cancer, $\chi^2(2) = 5.05, p = .08$, Cramer's $V = .21$. In general, more Central Eastern respondents reported knowing something about colorectal cancer than Middle Eastern respondents. For example, more Central Eastern participants stated that they knew a little about colorectal cancer (57.1%) than Middle Eastern participants (42.9%). Middle Eastern participants, however, were more likely to report knowing nothing about colorectal cancer (31.2%) than Central Eastern participants (11.4%).

There was also a marginally significant relationship between ethnicity and worry that a flexible sigmoidoscopy would be painful, $\chi^2(2) = 5.00, p = .082$. Cramer's $V = .21$. More Middle Eastern respondents stated that they were not worried about the painfulness of the procedure (50.0%) than Central Eastern respondents (28.6%). Central Eastern respondents, however, were more likely to be somewhat worried (45.7%) or extremely worried that a flexible sigmoidoscopy would be painful (25.7%) than Middle Eastern respondents (35.9% and 14.1%, respectively). The results also revealed a marginally significant relationship between ethnicity and worry that a fecal occult blood test would be embarrassing, $\chi^2(2) = 4.75, p = .09$. Cramer's $V = .21$. In general, more Central Eastern respondents stated that they were somewhat worried or extremely worried about that a fecal occult blood test would be embarrassing. For example, more Central Eastern respondents reported being extremely worried about the embarrassment of a fecal occult blood test (20.0%) than Middle Eastern respondents (11.7%). More Middle Eastern

respondents, however, stated that they were not worried about the test being embarrassing (53.2%) than Central Eastern respondents (31.4%).

Finally, there were no significant relationships between ethnicity and age, education, living in the United States, income, hearing about colorectal cancer tests, familiarity with flexible sigmoidoscopy, familiarity with a fecal occult blood test, knowing the ideal testing age, worry about a flexible sigmoidoscopy being embarrassing, and screening behavior, all *ns*.

Education Levels

The relationships between education and age, years living in the United States, income, the five knowledge items, four attitude items, and screening behavior are displayed in Table 18-20. The relationship between education and income was marginally significant, $\chi^2(8) = 42.44$, $p < .001$, Cramer's $V = .42$. Respondents with higher education levels had higher incomes than those with lower education levels. For example, more respondents with a PhD or post doctorate degree earned an annual salary of more than \$75,000 (77.8%) than those with a high school degree or less (7.4%). Conversely, more respondents with a lower education level (i.e., high school degree or lower) earned less than \$45,000 a year (74.1%) than those with a Ph.D. or higher (11.1%).

Table 18

Frequencies and Percentages for Age, Years in US, and Income by Education

		High School and Below		Some College/Associate's Degree		Bachelor's Degree and Some Graduate Work		Master's Degree		PhD and Post Doctorate	
		n	%	n	%	n	%	n	%	n	%
Age											
	54 Years or Less	8	28.6	7	30.4	11	47.8	12	40.0	9	50.0
	55 to 64 Years	16	57.1	10	43.5	9	39.1	14	46.7	5	27.8
	Over 64	4	14.3	6	26.1	3	13.0	4	13.3	4	22.2
Years in US											
	15 Years or Less	7	25.0	10	41.7	5	21.7	3	9.7	3	16.7
	16 to 25 Years	10	35.7	4	16.7	8	34.8	12	38.7	5	27.8
	26 to 35 Years	10	35.7	5	20.8	8	34.8	11	35.5	7	38.9
	36 Years or More	1	3.6	5	20.8	2	8.7	5	16.1	3	16.7
Income											
	Less than \$45,000	20	74.1	10	43.5	6	27.3	7	23.3	2	11.1
	\$45,001 to \$75,000	5	18.5	9	39.1	10	45.5	7	23.3	2	11.1
	More than \$75,000	2	7.4	4	17.4	6	27.3	16	53.3	14	77.8

Table 19

Frequencies and Percentages for the Five Knowledge Items by Education

		High School and Below		Some College/Associate's Degree		Bachelor's Degree and Some Graduate Work		Master's Degree		PhD and Post Doctorate	
		n	%	n	%	n	%	n	%	n	%
Have you heard of CRC?											
I know nothing		9	32.1	7	29.2	7	29.2	8	26.7	2	11.8
I know a little		16	57.1	12	50.0	9	37.5	10	33.3	9	52.9
I know a lot		3	10.7	5	20.8	8	33.3	12	40.0	6	35.3
Have you heard of tests for CRC?											
I know nothing		9	33.3	9	37.5	9	37.5	10	33.3	2	11.1
I know a little		16	59.3	8	33.3	6	25.0	10	33.3	9	50.0
I know a lot		2	7.4	7	29.2	9	37.5	10	33.3	7	38.9
Are you familiar with FS?											
I know nothing		12	42.9	13	54.2	13	54.2	14	46.7	7	38.9
I know a little		13	46.4	4	16.7	6	25.0	5	16.7	4	22.2
I know a lot		3	10.7	7	29.2	5	20.8	11	36.7	7	38.9

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy;

Table 19, continued

Frequencies and Percentages for the Five Knowledge Items by Education

	High School and Below		Some College/Associate's Degree		Bachelor's Degree and Some Graduate Work		Master's Degree		PhD and Post Doctorate	
	n	%	n	%	n	%	n	%	n	%
Are you familiar with FOBT?										
I know nothing	15	53.6	13	54.2	13	54.2	14	46.7	6	33.3
I know a little	10	35.7	4	16.7	7	29.2	4	13.3	6	33.3
I know a lot	3	10.7	7	29.2	4	16.7	12	40.0	6	33.3
Are you familiar with the ideal testing age?										
I know nothing	10	35.7	15	62.5	9	37.5	15	50.0	6	33.3
I know a little	15	53.6	5	20.8	8	33.3	5	16.7	7	38.9
I know a lot	3	10.7	4	16.7	7	29.2	10	33.3	5	27.8

Note: FOBT = Fecal Occult Blood Test

Table 20

Frequencies and Percentages for the Four Attitude Items and Screening Behavior by Education

	High School and Below		Some College/ Associate's Degree		Bachelor's Degree and Some Graduate Work		Master's Degree		PhD and Post Doctorate	
	n	%	n	%	n	%	n	%	n	%
Would you be worried that:										
FS would be embarrassing?										
Not worried	11	39.3	11	45.8	11	45.8	15	50.0	9	50.0
Somehow worried	12	42.9	12	50.0	12	50.0	10	33.3	6	33.3
Extremely worried	5	17.9	1	4.2	1	4.2	5	16.7	3	16.7
FS would be painful?										
Not worried	11	39.3	11	45.8	11	45.8	15	50.0	8	44.4
Somehow worried	12	42.9	10	41.7	9	37.5	10	33.3	6	33.3
Extremely worried	5	17.9	3	12.5	4	16.7	5	16.7	4	22.2
FOBT would be embarrassing?										
Not worried	11	39.3	10	41.7	12	50.0	15	51.7	11	61.1
Somehow worried	10	35.7	11	45.8	10	41.7	11	37.9	4	22.2
Extremely worried	7	25.0	3	12.5	2	8.3	3	10.3	3	16.7

Note: FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 20, continued

Frequencies and Percentages for the Four Attitude Items and Screening Behavior by Education

Would you be worried that:		High School and Below		Some College/ Associate's Degree		Bachelor's Degree and Some Graduate Work		Master's Degree		PhD and Post Doctorate	
		n	%	n	%	n	%	n	%	n	%
FOBT would be painful?											
Not worried		10	40.0	11	50.0	9	42.9	13	56.5	8	53.3
Somehow worried		10	40.0	7	31.8	11	52.4	6	26.1	5	33.3
Extremely worried		5	20.0	4	18.2	1	4.8	4	17.4	2	13.3
Have you ever seen any health care provider for CRC Screening?											
No		18	64.3	16	66.7	14	58.3	21	67.7	8	44.4
Yes		10	35.7	8	33.3	10	41.7	10	32.3	10	55.6

Note: CRC = Colorectal Cancer; FOBT = Fecal Occult Blood Test

The results revealed a marginally significant relationship between education and having heard about colorectal cancer tests, $\chi^2(2) = 13.72, p = .089$, Cramer's $V = .24$. In general, respondents with higher education levels were more likely to know a lot about colorectal cancer tests than those with lower education levels. For example, more respondents with a PhD reported that they knew a lot about colorectal cancer tests (38.9%) compared to those with a high school diploma or less (7.4%). The relationship between education and familiarity with the ideal testing age was also marginally significant, $\chi^2(2) = 14.79, p = .063$. Cramer's $V = .24$. In general, more respondents with a high school education or less reported know a little about the ideal colorectal cancer testing age (53.6%) than other respondents with higher education levels, such as those with some college or an associate's degree (20.8%).

The results failed to reveal significant relationships between education and age, years living in the United States, hearing about colorectal cancer, familiarity with flexible sigmoidoscopy or fecal occult test, worry that flexible sigmoidoscopy was embarrassing or painful, worry that fecal occult blood tests were embarrassing or painful, and screening behaviors, all *ns*.

Age Group

The relationships between age and years living in the United States, income, the five knowledge items, four attitude items, and screening behavior are displayed in Table 21 - 23. The relationship between age and years living in the United States was significant, $\chi^2(6) = 13.93, p < .05$, Cramer's $V = .24$. More respondents who were over 64

years of age lived in the United States for 15 years or less (40.0%) than those who were under 54 (21.3%) and those who were between 55 and 64 (18.5%). More respondents who were under 55 years of age lived in the United States for between 16 and 25 years (40.4%) than those who were between 55 and 64 (25.9%) and those over 64 years of age (25.0%).

Table 21

Frequencies and Percentages for Years in US, and Income by Age

	54 Years or Less		55 to 64 Years		Over 64		χ^2	<i>p</i>
	n	%	n	%	n	%		
Years in US							13.93	.030
15 Years or Less	10	21.3	10	18.5	8	40.0		
16 to 25 Years	19	40.4	14	25.9	5	25.0		
26 to 35 Years	17	36.2	18	33.3	4	20.0		
36 Years or More	1	2.1	12	22.2	3	15.0		
Income							6.57	.160
Less than 45,000	15	33.3	16	31.4	13	61.9		
\$45,001 to \$75,000	13	28.9	16	31.4	4	19.0		
More than \$75,000	17	37.8	19	37.3	4	19.0		

Table 22

Frequencies and Percentages for the Five Knowledge Items by Age

	54 Years or Less		55 to 64 Years		Over 64		χ^2	<i>p</i>
	n	%	n	%	n	%		
Have you heard of CRC?							8.79	.067
I know nothing	15	31.9	10	18.9	8	40.0		
I know a little	17	36.2	27	50.9	11	55.0		
I know a lot	15	31.9	16	30.2	1	5.0		
Have you heard of tests for CRC?							5.00	.287
I know nothing	14	29.8	15	28.3	10	50.0		
I know a little	19	40.4	21	39.6	8	40.0		
I know a lot	14	29.8	17	32.1	2	10.0		
Are you familiar with FS?							6.47	.167
I know nothing	22	46.8	23	42.6	13	65.0		
I know a little	10	21.3	16	29.6	6	30.0		
I know a lot	15	31.9	15	27.8	1	5.0		
Are you familiar with FOBT?							3.42	.490
I know nothing	23	48.9	25	46.3	12	60.0		
I know a little	10	21.3	15	27.8	6	30.0		
I know a lot	14	29.8	14	25.9	2	10.0		
Are you familiar with the ideal testing age?							7.03	.135
I know nothing	19	40.4	23	42.6	12	60.0		
I know a little	15	31.9	17	31.5	8	40.0		
I know a lot	13	27.7	14	25.9	0	0.0		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 23

Frequencies and Percentages for the Four Attitude Items and Screening Behavior by Age

Would you be worried that:	54 Years or Less		55 to 64 Years		Over 64		χ^2	<i>p</i>
	n	%	n	%	n	%		
FS would be embarrassing?							2.52	.641
Not worried	19	40.4	27	50.0	9	45.0		
Somehow worried	23	48.9	21	38.9	7	35.0		
Extremely worried	5	10.6	6	11.1	4	20.0		
FS would be painful?							1.82	.769
Not worried	19	40.4	26	48.1	9	45.0		
Somehow worried	20	42.6	20	37.0	6	30.0		
Extremely worried	8	17.0	8	14.8	5	25.0		
FOBT would be embarrassing?							5.26	.261
Not worried	16	34.8	31	57.4	10	50.0		
Somehow worried	21	45.7	17	31.5	7	35.0		
Extremely worried	9	19.6	6	11.1	3	15.0		
FOBT would be painful?							4.97	.290
Not worried	14	36.8	27	56.3	8	44.4		
Somehow worried	16	42.1	17	35.4	6	33.3		
Extremely worried	8	21.1	4	8.3	4	22.2		
CRC Screening							.97	.617
No	29	61.7	32	59.3	15	71.4		
Yes	18	38.3	22	40.7	6	28.6		

Note: FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

There was also a marginally significant relationship between age and having heard about colorectal cancer, $\chi^2(4) = 8.785, p = .067$, Cramer's $V = .27$. In general, older respondents were more likely to report knowing a little about colorectal cancer. For example, more respondents who were over 64 years of age reported knowing a little about colorectal cancer (55.0%) than those who were younger than 55 (36.2%). There were no significant relationships between age and income, having heard about colorectal cancer tests, familiarity with flexible sigmoidoscopy, familiarity with fecal occult blood tests, familiarity with the ideal testing age for colorectal cancer, the four attitude items, and screening behavior, all *ns*.

Years Living in the United States

The relationships between years living in the United States and income, the five knowledge items, four attitude items, and screening behavior are displayed in Table 24 - 26. The relationship between years living in the United States and income was significant, $\chi^2(6) = 16.19, p < .05$, Cramer's $V = .26$. More respondents who had lived in the United States for 15 years or less earned less than \$45,000 per year (66.7%) than those who had been living in the United States for 16 to 25 years (35.1%), 26 to 35 years (25.6%), or 36 or more years (18.8%). More respondents who had lived in the United States for 36 or more years earned over \$75,000 per year (56.3%) than those who lived in the United States 35 years or less. The results failed to reveal significant relationships between years living in the United States and the five knowledge items, the four attitude items, and screening behavior, all *ns*.

Table 24

Frequencies and Percentages for Income and Screening Behavior by Years in United States

	15 Years or Less		16 to 25 Years		26 to 35	Years	36 Years or More		χ^2	<i>p</i>
	n	%	n	%	n	%	n	%		
Income									16.19	.013
Less than \$45,000	18	66.7	13	35.1	10	25.6	3	18.8		
\$45,001 to \$75,000	5	18.5	11	29.7	13	33.3	4	25		
More than \$75,000	4	14.8	13	35.1	16	41.0	9	56.2		
CRC Screening									4.76	.190
No	21	75	22	56.4	26	63.4	7	43.8		
Yes	7	25	17	43.6	15	36.6	9	56.3		

Table 25

Frequencies and Percentages for the Five Knowledge Items by Years in United States

		15 Years or Less		16 to 25 Years		26 to 35 Years		36 Years or More		χ^2	<i>p</i>
		n	%	n	%	n	%	n	%		
Have you heard of CRC?										5.85	.440
	I know nothing	8	28.6	13	33.3	11	26.8	1	7.1		
	I know a little	15	53.6	16	41.0	17	41.5	7	50.0		
	I know a lot	5	17.9	10	25.6	13	31.7	6	42.9		
Have you heard of tests for CRC?										2.16	.905
	I know nothing	9	32.1	13	34.2	13	31.7	4	26.7		
	I know a little	13	46.4	15	39.5	15	36.6	5	33.3		
	I know a lot	6	21.4	10	26.3	13	31.7	6	40.0		
Are you familiar with FS?										4.25	.644
	I know nothing	14	50.0	20	51.3	20	48.8	5	33.3		
	I know a little	9	32.1	10	25.6	8	19.5	4	26.7		
	I know a lot	5	17.9	9	23.0	13	31.7	6	40.0		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy

Table 25, continued

Frequencies and Percentages for the Five Knowledge Items by Years in United States

		15 Years or Less		16 to 25 Years		26 to 35 Years		36 Years or More		χ^2	<i>p</i>
		n	%	n	%	n	%	n	%		
69	Are you familiar with FOBT?									2.72	.843
	I know nothing	15	53.6	20	51.3	20	48.8	6	40.0		
	I know a little	8	28.6	10	25.6	8	19.5	4	26.7		
	I know a lot	5	17.9	9	23.1	13	31.7	5	33.3		
	Are you familiar with the ideal testing age?									4.70	.583
	I know nothing	17	60.7	16	41.0	17	41.5	5	33.3		
	I know a little	7	25.0	14	35.9	13	31.7	5	33.3		
	I know a lot	4	14.3	9	23.1	11	26.8	5	33.3		

Note: FOBT = Fecal Occult Blood Test

Table 26

Frequencies and Percentages for the Four Attitude Items by Years in United States

Would you be worried that:	15 Years or Less		16 to 25 Years		26 to 35 Years		36 Years or More		χ^2	<i>p</i>
	n	%	n	%	n	%	n	%		
FS would be embarrassing?									4.96	.549
Not worried	14	50.0	17	43.6	18	43.9	8	53.3		
Somehow worried	13	46.4	18	46.2	16	39.0	4	26.7		
Extremely worried	1	3.6	4	10.3	7	17.1	3	20.0		
FS would be painful?									1.82	.935
Not worried	14	50.0	16	41.0	18	43.9	8	53.3		
Somehow worried	10	35.7	17	43.6	15	36.6	4	26.7		
Extremely worried	4	14.3	6	15.4	8	19.5	3	20.0		
FOBT would be embarrassing?									1.59	.954
Not worried	13	46.4	16	42.1	21	51.2	8	53.3		
Somehow worried	12	42.9	15	39.5	14	34.1	5	33.3		
Extremely worried	3	10.7	7	18.4	6	14.6	2	13.3		
FOBT would be painful?									4.10	.663
Not worried	10	40	13	40.6	20	58.8	8	53.3		
Somehow worried	11	44	12	37.5	11	32.4	5	33.3		
Extremely worried	4	16	7	21.9	3	8.8	2	13.3		

Note: FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Income Level

The relationships between income and the five knowledge items, four attitude items, and screening behavior are displayed in Table 27-28. The results revealed significant relationships between income and the four attitude items. Respondent income and worry that a flexible sigmoidoscopy would be embarrassing were significantly related, $\chi^2(6) = 10.81, p < .05$, Cramer's $V = .21$. A greater proportion of respondents who earned more than \$75,000 per year reported that they were not worried that a flexible sigmoidoscopy would be embarrassing compared to those earning less than \$45,000 per year (43.2%) and those earning between \$45,001 and \$75,000 per year (30.3%). More respondents who earned between \$45,001 and \$75,000, however, reported being somewhat worried about the procedure being embarrassing (54.5%) than those who earned more than \$75,000 per year (23.8%). Additionally, there was a significant relationship between income and worry that flexible sigmoidoscopy would be painful, $\chi^2(6) = 10.85, p < .05$, Cramer's $V = .21$. In general, those who earned less income per year reported that they were somewhat worried that a flexible sigmoidoscopy would be painful than those who earned more than \$75,000. For example, more respondents who earned between \$45,001 and \$75,000 per year reported that they were somewhat worried about the painfulness of the procedure (48.5%) than those who earned more than \$75,000 per year (26.2%).

Table 27

Frequencies and Percentages for Five Knowledge Items by Income

	Less than 45,000		\$45,001 to \$75,000		More than \$75,000		χ^2	<i>p</i>
	n	%	n	%	n	%		
Have you heard of CRC?							6.92	.140
I know nothing	16	36.4	8	24.2	7	17.1		
I know a little	21	47.7	14	42.4	19	46.3		
I know a lot	7	15.9	11	33.3	15	36.6		
Have you heard of tests for CRC?							4.55	.337
I know nothing	16	37.2	12	36.4	8	19.0		
I know a little	17	39.5	11	33.3	20	47.6		
I know a lot	10	23.3	10	30.3	14	33.3		
Are you familiar with FS?							6.47	.168
I know nothing	24	54.5	17	51.5	15	35.7		
I know a little	12	27.3	9	27.3	10	23.8		
I know a lot	8	18.2	7	21.2	17	40.5		
Are you familiar with FOBT?							6.61	.158
I know nothing	23	52.3	17	51.5	18	42.9		
I know a little	12	27.3	10	30.3	7	16.7		
I know a lot	9	20.5	6	18.2	17	40.5		
Are you familiar with the ideal testing age?							3.98	.408
I know nothing	22	50.0	15	45.5	15	35.7		
I know a little	15	34.1	11	33.3	13	31.0		
I know a lot	7	15.9	7	21.2	14	33.3		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy

Table 28

Frequencies and Percentages for Four Attitude Items and Screening Behavior by Income

Would you be worried that:	Less than 45,000		\$45,001 to \$75,000		More than \$75,000		χ^2	<i>p</i>
	n	%	n	%	n	%		
FS would be embarrassing?							10.81	.029
Not worried	19	43.2	10	30.3	26	61.9		
Somehow worried	22	50.0	18	54.5	10	23.8		
Extremely worried	3	6.8	5	15.2	6	14.3		
FS would be painful?							10.85	.028
Not worried	21	47.7	8	24.2	25	59.5		
Somehow worried	18	40.9	16	48.5	11	26.2		
Extremely worried	5	11.4	9	27.3	6	14.3		
FOBT would be embarrassing?							10.81	.029
Not worried	18	40.9	11	33.3	28	68.3		
Somehow worried	19	43.2	15	45.5	10	24.4		
Extremely worried	7	15.9	7	21.2	3	7.3		
FOBT would be painful?							13.10	.011
Not worried	16	44.4	8	26.7	25	67.6		
Somehow worried	12	33.3	16	53.3	10	27.0		
Extremely worried	8	22.2	6	20.0	2	5.4		
CRC Screening							3.76	.153
No	31	68.9	22	66.7	21	50.0		
Yes	14	31.1	11	33.3	21	50.0		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

There was also a significant relationship between income and worry that a fecal blood occult test would be embarrassing, $\chi^2 (4) = 10.81, p < .05$, Cramer's $V = .21$. In general, respondents who earned less than \$75,000 per year reported that they were somewhat worried about a fecal blood occult test being embarrassing than those who earned more \$75,000 per year. For instance, more respondents who earned between \$45,001 and \$75,000 reported that they were somewhat worried that fecal blood occult tests would be embarrassing (45.5%) than those earning more than \$75,000 per year (24.4%).

Additionally, more respondents who earned more than \$75,000 per year reported they were not worried that the procedure would be embarrassing (68.3%) than those who earned less than \$45,000 per year (33.3%) and those who earned between \$45,001 and \$75,000 (40.9%). Finally, there was a significant relationship between income and worry that a fecal blood occult test would be painful, $\chi^2 (4) = 13.10, p < .05$, Cramer's $V = .25$. In general, respondents who earned less than \$75,000 per year reported they were extremely worried that a fecal blood occult test would be painful whereas respondents who earned more than \$75,000 per year reported they were not worried that a fecal occult blood test would be painful. For example, more respondents who earned less than \$45,000 reported they were extremely worried about the pain levels of a fecal occult blood test (22.2%) than those who earned more than \$75,000 per year (5.4%). A greater proportion of respondents who earned more than \$75,000, on the other hand, reported they were not worried about the pain levels of the test (67.6%) than those who earned less

than \$45,000 per year (44.4%). Finally, results failed to reveal significant relationships between income and the five knowledge items, and screening behavior, all *ns*.

Knowledge Items

The relationships between the four attitude items, screening behavior and the five knowledge items are displayed in Table 29-33. There were significant relationships between screening behaviors and all knowledge items, however, because screening behavior is the main focus of the paper, the results will be mentioned in the screening behavior section below. The results failed to reveal significant relationships between the four attitude items and five knowledge items, all *ns*.

Screening Behaviors

As shown in Table 34, there were no significant relationships between screening behavior and gender, ethnicity, education, age, years living in the United States, and income, all *ns*. As shown in Table 35, the results revealed that there were significant relationships between the screening items and the knowledge items. Specifically, the relationship between having heard about colorectal cancer and having seen a health care provider for a CRC screening test was significant, $\chi^2(2) = 24.53, p < .001$, Cramer's $V = .45$. More participants who did not see a health care provider for a CRC screening reported knowing nothing about colorectal cancer (38.7%) than those who did see a health care provider (8.3%), whereas more participants who did see a health care provider for a colorectal cancer screening reported knowing a lot about colorectal cancer (50.0%) than those who did not see a health care provider (13.3%).

Table 29

Frequencies and Percentages for Four Attitude Items and Screening Behaviors by Knowledge Item - Have you heard of colorectal cancer

Would you be worried that:	Have you heard of colorectal cancer?						χ^2	<i>p</i>
	I know nothing		I know a little		I know a lot			
	n	%	n	%	n	%		
FS would be embarrassing?							3.41	.491
Not worried	16	48.5	28	49.1	13	38.2		
Somehow worried	14	42.4	24	42.1	14	41.2		
Extremely worried	3	9.1	5	8.8	7	20.6		
FS would be painful?							4.04	.400
Not worried	17	51.5	25	43.9	14	41.2		
Somehow worried	11	33.3	25	43.9	11	32.4		
Extremely worried	5	15.2	7	12.3	9	26.5		
FOBT would be embarrassing?							6.50	.165
Not worried	15	45.5	31	54.4	13	39.4		
Somehow worried	14	42.4	21	36.8	11	33.3		
Extremely worried	4	12.1	5	8.8	9	27.3		
FOBT would be painful?							5.78	.216
Not worried	15	55.6	23	48.9	12	38.7		
Somehow worried	7	25.9	21	44.7	11	35.5		
Extremely worried	5	18.5	3	6.4	8	25.8		
CRC Screening							24.53	.000
No	29	87.9	36	64.3	10	29.4		
Yes	4	12.1	20	35.7	24	70.6		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 30

Frequencies and Percentages for Four Attitude Items and Screening Behaviors by Knowledge Item - Have you heard of tests for colorectal cancer

	Have you heard of tests for colorectal cancer?							
	I know nothing		I know a little		I know a lot			
Would you be worried that:	n	%	n	%	n	%	χ^2	<i>p</i>
FS would be embarrassing?							.90	.924
Not worried	16	41.0	24	48.0	17	48.6		
Somehow worried	17	43.6	21	42.0	14	40.0		
Extremely worried	6	15.4	5	10.0	4	11.4		
FS would be painful?							7.18	.127
Not worried	16	41.0	22	44.0	18	51.4		
Somehow worried	14	35.9	24	48.0	9	25.7		
Extremely worried	9	23.1	4	8.0	8	22.9		
FOBT would be embarrassing?							6.50	.165
Not worried	16	41.0	27	55.1	16	45.7		
Somehow worried	16	41.0	19	38.8	11	31.4		
Extremely worried	7	17.9	3	6.1	8	22.9		
FOBT would be painful?							5.78	.216
Not worried	14	42.4	21	53.8	15	45.5		
Somehow worried	13	39.4	16	41.0	10	30.3		
Extremely worried	6	18.2	2	5.1	8	24.2		
CRC Screening							27.26	.000
No	34	87.2	32	65.3	10	28.6		
Yes	5	12.8	17	34.7	25	71.4		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 31

Frequencies and Percentages for Four Attitude Items and Screening Behaviors by Knowledge Item - Are you familiar with FS

Would you be worried that:	Are you familiar with FS?						χ^2	<i>p</i>
	I know nothing		I know a little		I know a lot			
	n	%	n	%	n	%		
FS would be embarrassing?							.61	.962
Not worried	29	48.3	13	40.6	16	48.5		
Somehow worried	24	40.0	15	46.9	13	39.4		
Extremely worried	7	11.7	4	12.5	4	12.1		
FS would be painful?							2.01	.735
Not worried	28	46.7	12	37.5	17	51.5		
Somehow worried	22	36.7	15	46.9	10	30.3		
Extremely worried	10	16.7	5	15.6	6	18.2		
FOBT would be embarrassing?							2.21	.698
Not worried	29	48.3	15	48.4	16	48.5		
Somehow worried	23	38.3	13	41.9	10	30.3		
Extremely worried	8	13.3	3	9.7	7	21.2		
FOBT would be painful?							3.54	.472
Not worried	21	43.8	13	48.1	17	54.8		
Somehow worried	19	39.6	12	44.4	8	25.8		
Extremely worried	8	16.7	2	7.4	6	19.4		
CRC Screening							23.71	.000
No	48	81.4	18	56.3	10	30.3		
Yes	11	18.6	14	43.8	23	69.7		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 32

Frequencies and Percentages for Four Attitude Items and Screening Behaviors by Knowledge Item - Are you familiar with FOBT

	Are you familiar with FOBT?							
	<u>I know nothing</u>		<u>I know a little</u>		<u>I know a lot</u>			
Would you be worried that:	n	%	n	%	n	%	χ^2	<i>p</i>
FS would be embarrassing?							.37	.985
Not worried	30	49.2	14	43.8	14	43.8		
Somehow worried	24	39.3	14	43.8	14	43.8		
Extremely worried	7	11.5	4	12.5	4	12.5		
FS would be painful?							1.87	.761
Not worried	29	47.5	12	37.5	16	50.0		
Somehow worried	22	36.1	15	46.9	10	31.3		
Extremely worried	10	16.4	5	15.6	6	18.8		
FOBT would be embarrassing?							1.01	.908
Not worried	31	51.7	15	46.9	14	43.8		
Somehow worried	21	35.0	13	40.6	12	37.5		
Extremely worried	8	13.3	4	12.5	6	18.8		
FOBT would be painful?							3.74	.443
Not worried	25	49.0	10	40.0	16	53.3		
Somehow worried	17	33.3	13	52.0	9	30.0		
Extremely worried	9	17.6	2	8.0	5	16.7		
CRC Screening							14.90	.001
No	46	75.4	19	61.3	11	34.4		
Yes	15	24.6	12	38.7	21	65.6		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 33

Frequencies and Percentages for Four Attitude Items and Screening Behaviors by Knowledge Items - Are you familiar with the ideal testing age

		Are you familiar with the ideal testing age?							
		I know nothing		I know a little		I know a lot			
Would you be worried that:		n	%	n	%	n	%	χ^2	p
FS would be embarrassing?								2.91	.573
Not worried		28	50.9	16	39.0	14	48.3		
Somehow worried		19	34.5	20	48.8	13	44.8		
Extremely worried		8	14.5	5	12.2	2	6.9		
FS would be painful?								4.95	.293
Not worried		28	50.9	14	34.1	15	51.7		
Somehow worried		17	30.9	21	51.2	9	31.0		
Extremely worried		10	18.2	6	14.6	5	17.2		
FOBT would be embarrassing?								1.45	.836
Not worried		27	49.1	18	43.9	15	53.6		
Somehow worried		21	38.2	17	41.5	8	28.6		
Extremely worried		7	12.7	6	14.6	5	17.9		
FOBT would be painful?								5.55	.235
Not worried		25	52.1	13	41.9	13	48.1		
Somehow worried		15	31.3	16	51.6	8	29.6		
Extremely worried		8	16.7	2	6.5	6	22.2		
CRC Screening								19.38	.000
No		42	76.4	26	65.0	8	27.6		
Yes		13	23.6	14	35.0	21	72.4		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 34

Frequencies and Percentages for Gender, Ethnicity, Education, Age, Years in US, and Income by Screening Behavior

	CRC Screening				χ^2	<i>p</i>
	No		Yes			
	n	%	n	%		
What is your gender:					.52	.470
Male	56	72.7	32	66.7		
Female	21	27.3	16	33.3		
What is your ethnicity:					2.12	.145
Eastern Central	18	25.7	17	38.6		
Eastern Middle	52	74.3	27	61.4		
Education Levels collapsed					3.19	.527
High School and Below	18	23.4	10	20.8		
Some College/Associate's Degree	16	20.8	8	16.7		
Bachelor's Degree and Some Graduate Work	14	18.2	10	20.8		
Master's Degree	21	27.3	10	20.8		
PhD and Post Doctorate	8	10.4	10	20.8		
Age Collapsed					.97	.617
54 Years or Less	29	38.2	18	39.1		
55 to 64 Years	32	42.1	22	47.8		
Over 64	15	19.7	6	13.0		
Years Living in the United States					4.76	.190
15 Years or Less	21	27.6	7	14.6		
16 to 25 Years	22	28.9	17	35.4		
26 to 35 Years	26	34.2	15	31.3		
36 Years or More	7	9.2	9	18.8		
Income levels--3 Levels					3.76	.153
Less than 45,000	31	41.9	14	30.4		
\$45,001 to \$75,000	22	29.7	11	23.9		
More than \$75,000	21	28.4	21	45.7		

Table 35

Frequencies and Percentages for Five Knowledge Items by Screening Behavior

	CRC Screening					
	No		Yes			
	n	%	n	%	χ^2	<i>p</i>
Have you heard of CRC?					24.53	.000
I know nothing	29	38.7	4	8.3		
I know a little	36	48.0	20	41.7		
I know a lot	10	13.3	24	50.0		
Have you heard of tests for CRC?					27.26	.000
I know nothing	34	44.7	5	10.6		
I know a little	32	42.1	17	36.2		
I know a lot	10	13.2	25	53.2		
Are you familiar with FS?					23.71	.000
I know nothing	48	63.2	11	22.9		
I know a little	18	23.7	14	29.2		
I know a lot	10	13.2	23	47.9		
Are you familiar with FOBT?					14.90	.001
I know nothing	46	60.5	15	31.3		
I know a little	19	25.0	12	25.0		
I know a lot	11	14.5	21	43.8		
Are you familiar with the ideal testing age?					19.38	.000
I know nothing	42	55.3	13	27.1		
I know a little	26	34.2	14	29.2		
I know a lot	8	10.5	21	43.8		

Note: CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

There was also a significant relationship between having seen a health provider for a CRC screening and having heard about colorectal cancer tests, $\chi^2 (2) = 27.26, p < .001$, Cramer's $V = .47$. Participants who did not have a screening were more likely to report not knowing anything about colorectal cancer tests (44.7%) than those who reported having had a CRC screening (10.6%). Additionally, participants who reported having had a CRC screening were more likely to know a lot about colorectal cancer tests (53.2%) than those who reported that they had not had a CRC screening (13.2%).

Additionally, the relationship between familiarity with a flexible sigmoidoscopy and having had a screening by a health care provider for colorectal cancer was significant, $\chi^2 (2) = 23.71, p < .001$, Cramer's $V = .44$. More respondents who had not seen a health care provider for a CRC screening did not know anything about a flexible sigmoidoscopy (63.2%) than those who reported having had a CRC screening (22.9%). More respondents who had a CRC screening knew a lot about a flexible sigmoidoscopy (47.9%) than those who had not seen a health care provider for a screening (13.2%).

The relationship between familiarity with a fecal occult blood test and screening behavior was also significant, $\chi^2 (2) = 14.90, p < .001$, Cramer's $V = .35$. More participants who had not seen a health care provider for a CRC screening did not know anything about a fecal occult blood test (60.5%) than those who had been screened (31.3%). On the other hand, more participants who reported having had a screening knew a lot about a fecal occult blood test (43.8%) than those who had not had a CRC screening (14.5%). Finally, there was a significant relationship between knowing the ideal testing

age and screening behavior, $\chi^2(2) = 19.38, p < .001$, Cramer's $V = .40$. Specifically, more respondents who reported that they had not seen a health care provider for a CRC screening were also not familiar with the ideal testing age for colorectal cancer (55.3%) compared to those who had seen a health care provider (27.1%). However, more respondents who had been screened reported that they knew a lot about the ideal testing age for colorectal cancer (43.8%) than those who had not been screened (10.5%). As shown in Table 36, there were no significant relationships between screening behavior and the four attitude items, all *ns*.

Relationships Between Continuous Variables

Self-Efficacy

As shown in Table 37, all seven self-efficacy items were significantly positively correlated with each other. For example, confidence in the ability to remember when to have CRC screenings was highly correlated with confidence in the ability to schedule appointments for CRC screening, $r(98) = .93, p < .001$, keep appointments for CRC screenings, $r(98) = .70, p < .001$, ask questions about a change in bowel habits, $r(95) = .70, p < .001$, ask questions about the screening tests, $r(92) = .81, p < .001$, ask questions about test results, $r(90) = .75, p < .001$, and talk about colorectal cancer with their health care provider, $r(92) = .76, p < .001$.

Table 36

Frequencies and Percentages for Four Attitude Items by Screening Behavior

Would you be worried that:	CRC Screening				χ^2	<i>p</i>
	No		Yes			
	n	%	n	%		
FS would be embarrassing?					.18	.915
Not worried	34	44.7	23	47.9		
Somehow worried	33	43.4	19	39.6		
FS would be painful?					1.75	.417
Not worried	33	43.4	23	47.9		
Somehow worried	32	42.1	15	31.3		
Extremely worried	11	14.5	10	20.8		
FOBT would be embarrassing?					1.91	.385
Not worried	34	44.7	25	53.2		
Somehow worried	32	42.1	14	29.8		
Extremely worried	10	13.2	8	17.0		
FOBT would be painful?					.72	.698
Not worried	29	46.0	22	51.2		
Somehow worried	23	36.5	16	37.2		
Extremely worried	11	17.5	5	11.6		

Note: FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 37

Pearson Product Moment Correlations Between the Self-Efficacy Items

	1	2	3	4	5	6
1. remember when to see CRC screening						
2. schedule appointment for CRC screening	.928 **					
3. keep the appointment for CRC screening	.697 **	.798 **				
4. ask questions about: a. changes in bowel habits	.704 **	.728 **	.565 **			
5. ask questions about: b. screening tests	.810 **	.828 **	.657 **	.800 **		
6. ask questions about: c. results	.748 **	.757 **	.707 **	.696 **	.832 **	
7. talk about CRC to my health care provider	.758 **	.756 **	.606 **	.805 **	.840 **	.889 **

Note: ** $p < .01$. CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Belief Items

As shown in Table 38, all six of the belief items were significantly positively correlated with each other. For example, more agreement with the necessity of early diagnosis of colorectal cancer was related to more agreement with knowing the survival rate of colorectal cancer if detected early, $r(119) = .40, p < .001$, the seriousness of late diagnosis of colorectal cancer, $r(121) = .47, p < .001$, knowing the chances of getting colorectal cancer, $r(120) = .29, p < .01$, willingness to be tested with a fecal occult blood test if recommended to do so by a friend, $r(122) = .23, p < .05$, and willingness to be tested with a flexible sigmoidoscopy if recommended to do so by a friend, $r(122) = .23, p < .05$.

Attitude, Knowledge, Belief, Self-Efficacy, and Willingness to be Screened

As shown in Table 39, total knowledge scores were significantly positively correlated with belief scores, $r(122) = .32, p < .001$, and cultural empowerment scores (i.e., self-efficacy), $r(108) = .33, p < .001$, suggesting that greater knowledge of colorectal cancer is associated with stronger beliefs about colorectal cancer and greater self-efficacy regarding behaviors associated with testing and CRC screening. Total knowledge was not significantly correlated with the attitudes toward colorectal cancer testing procedures, $r(123) = .06, p = .500$, or willingness to be screened for colorectal cancer, $r(78) = .08, p = .504$.

Table 38

Pearson Product Moment Correlations Between the Belief Items

	1	2	3	4	5
1. Is it necessary to diagnose CRC early					
2. I know the survival rate of CRC if found early	.404 **				
3. It is serious to diagnose CRC late	.466 **	.261 **			
4. I know the chance of getting CRC	.285 **	.673 **	.272 **		
5. I would get tested for FOBT if a friend recommended it	.229 *	.472 **	.355 **	.476 **	
6. I would get tested for FS if a friend recommended it	.232 **	.466 **	.359 **	.468 **	.936 **

Note: * $p < .05$, ** $p < .01$, CRC = Colorectal Cancer; FS = Flexible Sigmoidoscopy; FOBT = Fecal Occult Blood Test

Table 39

Pearson Product Moment Correlations Between Total Attitude, Knowledge, Belief, Self-Efficacy, and Willingness to be Screened

	Attitude	Knowledge	Belief	Self-Efficacy
Knowledge	.061			
Belief	.116	.324 **		
Self-Efficacy	-.115	.333 **	.241 *	
Willingness to be Screened	-.062	.076	.336 **	.110

Note: * $p < .05$, ** $p < .01$.

In addition, there were significant correlations between belief scores and cultural empowerment, $r(107) = .24, p < .05$, as well as willingness to be screened for colorectal cancer, $r(77) = .34, p < .01$. These results suggest that stronger beliefs about colorectal cancer were associated with greater self-efficacy regarding behaviors associated with testing and greater willingness to have CRC screening. However, belief scores were not significantly correlated with attitudes, $r(122) = .12, p = .198$. Finally, cultural empowerment was not significantly correlated with attitude scores, $r(108) = -.12, p = .231$, or willingness to be screened for colorectal cancer, $r(69) = .11, p = .362$.

Attitude, Knowledge, Belief, Self-Efficacy, Willingness to be Screened, and Age

As shown in Table 40, age was not significantly correlated with total knowledge scores, $r(119) = -.11, p = .230$, attitude scores, $r(119) = -.002, p = .981$, belief scores, $r(118) = .04, p = .705$, self-efficacy (cultural empowerment) scores, $r(104) = .00, p = 1.000$. In addition, the results failed to reveal a significant relationship between age and willingness to be screened for colorectal cancer, $r(78) = -.12, p = .295$.

Attitude, Knowledge, Belief, Self-Efficacy, Willingness to be Screened, Age, Years Living in the United States

As shown in Table 40, the number of years living in the United States was significantly correlated with cultural empowerment (self-efficacy) scores, $r(106) = .22, p < .05$. In other words, greater self-efficacy scores were related to more years living in the United States. The number of years living in the United States was not, however, significantly correlated with knowledge scores, $r(121) = .16, p = .08$, attitude scores, $r(121) = -.001, p = .990$, or belief scores, $r(120) = .17, p = .060$ ($r = .17$). Finally, the results also failed to reveal a significant relationship between the number of years living in the United States and willingness to be screened for colorectal cancer, $r(78) = .005, p = .963$.

Table 40

Pearson Product Moment Correlations of Total Attitude, Knowledge, Belief, Self-Efficacy, and Willingness to be Screened with Age

	Age	Years in US
Knowledge Total	-.110	.159
Attitude Total	-.002	-.001
Belief Total	.035	.171
Self-Efficacy Total	.000	.224 *
Willingness to get screened	-.119	.005

Note: * $p < .05$, ** $p < .01$.

Primary Analysis

Gender

An independent samples t -test was conducted to determine whether gender had an effect on willingness to be screened for colorectal cancer. As shown in Table 41, there males and females did not differ on their willingness to be screened, $t(79) = 1.66$, $p = .100$.

Table 41

Means and Standard Deviations for Willingness to be Screened by Gender

	n	Mean	SD	<i>t</i>	<i>p</i>
Willingness to get screened				1.66	.100
Male	58	3.40	1.38		
Female	23	2.83	1.44		

The knowledge, attitude, self-efficacy, and belief scores were examined to determine whether the scores differed based on respondent gender. A one-way multivariate analysis of variance (MANOVA) was conducted to test for gender differences. Means and standard deviations are displayed in Table 42. The overall multivariate effect was not significant, $F(4, 103) = 1.24, p = .299$. However, due to the exploratory nature of the study, the univariate analyses were also examined. The results revealed that there was a marginally significant gender effect on attitude scores, $F(1, 106) = 3.90, p = .051$. Women had marginally more positive attitudes toward colorectal screening procedures ($M = 7.09, SD = 2.34$) than men ($M = 6.08, SD = 2.50$).

Table 42

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Gender

	n	Mean	SD	<i>F</i>	<i>p</i>
Knowledge Total				1.01	.317
Male	75	9.17	3.21		
Female	33	9.88	3.68		
Attitude Total				3.90	.051
Male	75	6.08	2.50		
Female	33	7.09	2.34		
Belief Total				0.01	.918
Male	75	22.79	4.30		
Female	33	22.88	4.28		
Self-Efficacy Total				0.07	.798
Male	75	18.63	6.56		
Female	33	19.00	7.83		

Age

A one-way ANOVA was also conducted to determine the effects of age on willingness to be screened for colorectal cancer. As shown in Table 43, the results failed to reveal a significant effect for age on willingness to be screened, $F(2, 77) = .23, p = .799$.

Table 43

Means and Standard Deviations for Willingness to be Screened by Age

	N	Mean	SD	<i>F</i>	<i>p</i>
Willingness to get screened				0.23	.799
54 Years or Less	34	3.35	1.45		
55 to 64 Years	32	3.19	1.33		
Over 64	14	3.07	1.59		

A one-way MANOVA was conducted to examine the effects of age on the dependent measures including the knowledge, attitude, self-efficacy, and belief scores. Means and standard deviations are displayed in Table 44. The overall multivariate effect was not significant, $F(8, 198) = 1.62, p = .120$. Similarly, the results failed to reveal significant univariate effects for age on the attitude, belief, and self-efficacy (cultural empowerment) scores, all *ns*. All age groups had similar attitudes toward screening procedures and tests used to detect colorectal cancer, similar beliefs about colorectal cancer, and similar self-efficacy ratings toward colorectal cancer screenings. Age did, however, have a marginal effect on knowledge scores, $F(1, 102) = 2.48, p = .088$. Post hoc comparisons using Tukey's HSD test revealed that respondents over 64 years of age had marginally lower knowledge scores regarding colorectal cancer ($M = 7.57, SD = 2.03$) than those who were 54 years old or younger ($M = 9.81, SD = 3.57$).

Table 44

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Age

	n	Mean	SD	<i>F</i>	<i>p</i>
Knowledge Total				2.48	.088
54 Years or Less	42	9.81	3.57		
55 to 64 Years	49	9.37	3.26		
Over 64	14	7.57	2.03		
Attitude Total				1.27	.286
54 Years or Less	42	6.90	2.45		
55 to 64 Years	49	6.08	2.40		
Over 64	14	6.29	2.92		
Belief Total				0.92	.402
54 Years or Less	42	23.43	4.40		
55 to 64 Years	49	22.22	4.04		
Over 64	14	22.50	4.75		
Self-Efficacy Total				2.35	.101
54 Years or Less	42	18.24	7.50		
55 to 64 Years	49	19.86	6.28		
Over 64	14	15.50	6.33		

Ethnicity

An independent samples *t*-test was also conducted to determine the effects of ethnicity on willingness to be screened for colorectal cancer. As shown in Table 45, the results failed to reveal significant differences for willingness to be screened based on ethnicity, $t(71) = -.64, p = .523$.

Table 45

Means and Standard Deviations for Willingness to be Screened by Ethnicity

	n	Mean	SD	<i>t</i>	<i>p</i>
Willingness to get screened				-.64	.523
Eastern Central	20	3.05	1.32		
Eastern Middle	53	3.28	1.41		

In order to examine any differences based on ethnicity, a one-way MANOVA was conducted on the knowledge, attitude, self-efficacy, and belief scores using ethnicity as the between subjects effect. Means and standard deviations are displayed in Table 46. The overall multivariate effect was not significant, $F(4, 93) = 1.50, p = .209$. Due to the exploratory nature of the study, the univariate analysis was also examined. There was a significant univariate effect for ethnicity on attitude scores, $F(1, 96) = 5.30, p < .05$. Central Eastern Muslim respondents had significantly higher attitude scores toward

colorectal cancer testing procedures ($M = 7.36$, $SD = 2.30$) than Middle Eastern Muslim respondents ($M = 6.11$, $SD = 2.46$).

Table 46

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Ethnicity

	n	Mean	SD	<i>F</i>	<i>p</i>
Knowledge Total				.14	.709
Eastern Central	28	9.61	3.26		
Eastern Middle	70	9.33	3.35		
Attitude Total				5.30	.023
Eastern Central	28	7.36	2.30		
Eastern Middle	70	6.11	2.46		
Belief Total				.53	.467
Eastern Central	28	23.14	4.44		
Eastern Middle	70	22.44	4.22		
Self-Efficacy Total				.17	.685
Eastern Central	28	19.04	7.43		
Eastern Middle	70	18.39	7.03		

Income

A one-way ANOVA was also conducted to determine the effects of income level on willingness to be screened for colorectal cancer. As shown in Table 47, income had a significant effect on willingness to be screened for colorectal screening, $F(2, 75) = 3.97$,

$p < .05$. Post hoc comparisons using Tukey's HSD test revealed that respondents who earned more than \$75,000 annually were significantly more willing to be screened for colorectal cancer ($M = 3.78$, $SD = 1.41$) than participants who earned less than \$45,000 annually ($M = 2.75$, $SD = 1.46$).

Table 47

Means and Standard Deviations for Willingness to be Screened by Income

	n	Mean	SD	<i>F</i>	<i>p</i>
Willingness to get screened				3.97	.023
Less than \$45,000	32	2.75	1.46		
\$45,001 to \$75,000	23	3.35	1.15		
More than \$75,000	23	3.78	1.41		

The knowledge, attitude, self-efficacy, and belief scores were examined to determine whether the scores differed based on respondent income. A one-way multivariate analysis of variance (MANOVA) was conducted to test for income differences. Means and standard deviations are displayed in Table 48. The overall multivariate effect was significant, $F(8, 194) = 2.15$, $p < .05$. The univariate analyses revealed a significant effect for income on knowledge scores, $F(2, 100) = 3.79$, $p < .05$. Post hoc comparisons using Tukey's HSD test revealed that respondents who earned more than \$75,000 annually had significantly greater knowledge scores ($M = 10.55$, $SD = 3.39$) than participants who earned less than \$45,000 annually ($M = 8.51$, $SD = 3.01$). In

addition, there was a significant effect for income on attitude scores, $F(2, 100) = 3.94$, $p < .05$. Post hoc comparisons using Tukey's HSD test revealed that respondents who earned between \$45,000 and \$75,000 annually had significantly greater attitude scores ($M = 7.29$, $SD = 2.57$) compared to participants who earned over \$75,000 annually ($M = 5.61$, $SD = 2.27$).

Table 48

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Income

	n	Mean	SD	F	p
Knowledge Total				3.79	.026
Less than 45,000	37	8.51	3.01		
\$45,001 to \$75,000	28	9.21	3.36		
More than \$75,000	38	10.55	3.39		
Attitude Total				3.94	.022
Less than \$45,000	37	6.54	2.49		
\$45,001 to \$75,000	28	7.29	2.57		
More than \$75,000	38	5.61	2.27		
Belief Total				1.69	.191
Less than \$45,000	37	22.65	4.45		
\$45,001 to \$75,000	28	21.93	3.66		
More than \$75,000	38	23.84	4.59		
Self-Efficacy Total				.67	.514
Less than \$45,000	37	18.32	6.64		
\$45,001 to \$75,000	28	18.00	5.60		
More than \$75,000	38	19.79	7.88		

Education Levels

A one-way ANOVA was also conducted to determine whether education had an effect on willingness to be screened for colorectal cancer. As shown in Table 49, there was a marginally significant effect for education on willingness to be screened for colorectal cancer, $F(4, 76) = 2.33, p = .063$. Post hoc comparisons using Tukey's HSD test revealed that respondents who had a master's degree were significantly more willing to be screened ($M = 3.74, SD = 1.39$) than those who had earned only a high school or less ($M = 2.44, SD = 1.42$).

Table 49

Means and Standard Deviations for Willingness to be Screened by Education

	N	Mean	SD	<i>F</i>	<i>p</i>
Willingness to get screened				2.33	.063
High School and Below	18	2.44	1.42		
Some College/Associate's Degree	15	3.33	1.18		
Bachelor's Degree and Some Graduate Work	16	3.25	1.29		
Master's Degree	23	3.74	1.39		
PhD and Post Doctorate	9	3.33	1.58		

A one-way MANOVA was conducted to examine the effects of education level on the dependent measures including the knowledge, attitude, self-efficacy, and belief scores. Means and standard deviations are displayed in Table 50. The overall

multivariate effect was not significant, $F(16, 306) = .74, p = .751$. Similarly, the univariate analyses failed to reveal significant effects for education, all *ns*.

Table 50

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Education Levels

	n	Mean	SD	<i>F</i>	<i>p</i>
Knowledge Total				1.71	.152
High School and Below	21	8.10	2.14		
Some College/Associate's Degree	22	8.95	3.68		
Bachelor's Degree and Some Graduate Work	20	9.35	3.33		
Master's Degree	28	9.96	3.94		
PhD and Post Doctorate	17	10.65	2.83		
Attitude Total				.73	.573
High School and Below	21	6.95	2.60		
Some College/Associate's Degree	22	6.73	2.43		
Bachelor's Degree and Some Graduate Work	20	5.95	2.16		
Master's Degree	28	5.96	2.35		
PhD and Post Doctorate	17	6.47	3.00		
Belief Total				.14	.968
High School and Below	21	22.43	4.72		
Some College/Associate's Degree	22	23.27	3.31		
Bachelor's Degree and Some Graduate Work	20	23.00	4.91		
Master's Degree	28	22.82	4.11		
PhD and Post Doctorate	17	22.47	4.73		

Table 50, continued

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Education Levels

	n	Mean	SD	<i>F</i>	<i>p</i>
Self-Efficacy Total				.33	.860
High School and Below	21	17.86	7.62		
Some College/Associate's Degree	22	18.00	5.68		
Bachelor's Degree and Some Graduate Work	20	19.95	7.54		
Master's Degree	28	19.21	6.14		
PhD and Post Doctorate	17	18.59	8.49		

Years Living in the United States

A one-way MANOVA was conducted to examine the effects of years living in the United States on the dependent measures including the knowledge, attitude, self-efficacy, and belief scores. Means and standard deviations are displayed in Table 51. The overall multivariate effect was not significant, $F(23, 265) = .67, p = .782$. Similarly, the univariate analyses failed to reveal significant effects for years living in the United States on knowledge, attitude, self-efficacy, and belief scores, all *ns*.

Table 51

Means and Standard Deviations for Total Attitude, Knowledge, Belief, Self-Efficacy by Years in US

	N	Mean	SD	<i>F</i>	<i>p</i>
Knowledge Total				1.03	.383
15 Years or Less	23	8.39	3.04		
16 to 25 Years	34	9.41	3.24		
26 to 35 Years	37	9.68	3.62		
36 Years or More	13	10.23	3.56		
Attitude Total				0.40	.753
15 Years or Less	23	6.22	2.33		
16 to 25 Years	34	6.76	2.71		
26 to 35 Years	37	6.32	2.38		
36 Years or More	13	6.00	2.65		
Belief Total				0.63	.599
15 Years or Less	23	21.87	4.31		
16 to 25 Years	34	22.85	3.67		
26 to 35 Years	37	22.95	4.75		
36 Years or More	13	23.85	4.58		
Self-Efficacy Total				1.79	.154
15 Years or Less	23	16.83	6.49		
16 to 25 Years	34	17.76	7.99		
26 to 35 Years	37	19.73	6.09		
36 Years or More	13	21.54	6.53		

A separate one-way ANOVA was also conducted to determine whether years living in the United States had an effect on willingness to be screened for colorectal cancer. As shown in Table 52, the results failed to reveal a significant effect for years living in the United States on willingness to be screened for colorectal cancer, $F(3, 76) = 0.03, p = .994$.

Table 52

Means and Standard Deviations for Willingness to be Screened by Years Living in United States

	N	Mean	SD	F	p
Years Living in the United States				.03	.994
15 Years or Less	22	3.27	1.35		
16 to 25 Years	24	3.17	1.49		
26 to 35 Years	27	3.26	1.43		
36 Years or More	7	3.29	1.60		

Research Question 1

A multiple logistic regression analysis was conducted to predict colorectal screening behavior (0 = have not had screening, 1 = yes, have had screening). The predictors included the self-efficacy score, gender, and ethnicity. The results revealed that the model was significant, $\chi^2(3) = 18.79, p < .001$. As shown in Table 53, self-efficacy was a significant predictor of screening behavior (*Odds Ratio* = 1.16, $p < .001$).

Increases in self-efficacy predicted greater odds of having had colorectal screening. In other words, for every increase in self-efficacy (cultural empowerment) scores, respondents were 1.16 times more likely to be tested for colorectal cancer. Gender and ethnicity, however, were not significant predictors of the odds of screening behavior.

Table 53

Summary of Logistic Regression Analysis for Cultural Identity

	β	SE	Wald	df	p	Odds Ratio
Self-Efficacy Total	0.144	0.04	14.05	1	.000	1.155
Gender	-0.099	0.49	0.04	1	.841	0.906
Ethnicity	-0.422	0.51	0.69	1	.405	0.656

The effects of gender and ethnicity were examined to determine their effect on willingness to be screened. More specifically, a two-way ANOVA was conducted on willingness to be screened using gender and ethnicity as between subjects effects. Means and standard deviations are displayed in Table 54. The results failed to reveal significant effects for gender, $F(1, 69) = 1.64, p = .205$, and ethnicity, $F(1, 69) = .10, p = .759$. Similarly, the interaction effect for gender x ethnicity was not significant, $F(1, 69) = .26, p = .614$.

Table 54

Means and Standard Deviations for Willingness to be Screened by Gender and Ethnicity

	N	Mean	SD	F	p
Male				.26	.614
Eastern Central	12	3.17	1.19		
Eastern Middle	38	3.47	1.37		
Female					
Eastern Central	8	2.88	1.55		
Eastern Middle	15	2.80	1.42		

Research Question 2

A multiple logistic regression analysis was conducted to predict adult Central and Middle Eastern Muslim men and women's colorectal screening behavior, predicted by respondents' self-efficacy scores. As Table 55 shows, self-efficacy significantly predicted that an increase in cultural empowerment predicts a greater likelihood that participants were screened for colorectal cancer. For every increase in self-efficacy score, participants are 1.16 times more likely to be tested for colorectal cancer (*Odds Ratio* = 1.155).

Table 55

Summary of Logistic Regression for Cultural Empowerment Variables Predicting Screening Behavior

	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>df</i>	<i>p</i>	<i>Odds Ratio</i>
Self-Efficacy Sum	0.146	0.04	15.47	1	.000	1.157

Additionally, a multiple logistic regression analysis was conducted to predict respondent colorectal screening behaviors (0 = have not had screening, 1 = yes, have had screening). The predictors included self-efficacy scores, knowledge scores, attitude scores, belief scores, gender, age, ethnicity, years living in the United States, education, and income. The results revealed that the model was significant, $\chi^2(14) = 41.73, p < .001$. As shown in Table 56, self-efficacy was a significant predictor of the odds of screening for colorectal cancer (*Odds Ratio* = 1.18, $p < .01$). In addition, knowledge was also a significant predictor of the odds of screening for colorectal cancer (*Odds Ratio* = 1.40, $p < .01$). These results suggest that, while controlling for the other predictors, increases in self-efficacy predict greater odds of getting screened for colorectal cancer. Similarly, while controlling for the other predictors, increases in knowledge predict greater odds of getting screened for colorectal cancer. The remaining predictors (i.e., the attitude scores, belief scores, gender, age, ethnicity, years living in the United States,

education, and income) were not significant predictors of the odds of getting screened for colorectal cancer, all *ns*.

Table 56

Summary of Multiple Logistic Regression Analysis for Cultural Empowerment Variables Predicting Screened Behavior

	β	SE	Wald	df	<i>p</i>	Odds Ratio
Self-Efficacy Sum	0.165	0.05	9.74	1	.002	1.180
Knowledge Sum	0.337	0.11	9.55	1	.002	1.401
Attitude Sum	0.028	0.12	0.05	1	.816	1.028
Belief Sum	-0.014	0.08	0.03	1	.854	0.986
Male	0.871	0.67	1.67	1	.197	2.390
Age	0.065	0.05	1.49	1	.222	1.067
Central Eastern	0.562	0.62	0.82	1	.365	1.754
Years	-0.037	0.03	1.43	1	.232	0.964
High School or Less	-0.087	0.98	0.01	1	.929	0.917
Some College	0.142	1.00	0.02	1	.886	1.153
Some Graduate	1.069	1.04	1.07	1	.302	2.912
Masters	-1.554	0.92	2.85	1	.091	0.211
Income over \$75,000	0.745	0.86	0.75	1	.387	2.106
Income \$45,000-75,000	0.098	0.78	0.02	1	.901	1.103

A simple regression analysis was conducted to predict willingness to be screened for colorectal cancer using cultural empowerment (self-efficacy) scores as a predictor. The model was not significant, $F(1, 69) = .84, p = .362$, and accounted for only 1.2% of the variance ($R^2 = .012$). As shown in Table 57, self-efficacy was not a significant predictor of willingness to be screened for colorectal cancer ($Beta = .110, p = .362$).

Table 57

Summary of Simple Regression Analysis Using Self-efficacy to Predict Willingness to be Screened

	Unstandardized Coefficients		<i>Beta</i>	<i>t</i>	<i>p</i>
	<i>B</i>	<i>SE</i>			
Self-Efficacy Total	0.024	0.03	0.110	0.92	.362

A multiple regression analysis was conducted to predict willingness to be screened for colorectal cancer using self-efficacy scores, knowledge scores, attitude scores, belief scores, age, years living in the United States, gender, ethnicity, education, and income as predictors (see Table 58). Multiple regression analysis is used with continuous dependent variables and categorical or continuous independent variables. Because categorical predictor variables cannot be entered directly into a regression model and be meaningfully interpreted, dummy variables are a way of adding the values of a

nominal or ordinal variable to a regression equation. For the current regression analysis, gender, ethnicity, education, and income were dummy coded.

Table 58

Summary of Multiple Linear Regression Using Total Self-Efficacy, Total Beliefs, Total Knowledge, Total Attitudes, Age, Years Living In US, Gender, Ethnicity, Education Level and Income Predicting Willingness to be Screened

	Unstandardized Coefficients				
	B	SE	Beta	t	p
Self-Efficacy Sum	0.045	0.03	0.201	1.64	.109
Knowledge Sum	-0.078	0.06	-0.157	-1.25	.218
Attitude Sum	0.060	0.08	0.099	0.77	.447
Belief Sum	0.151	0.04	0.424	3.50	.001
Age	-0.017	0.03	-0.075	-0.60	.555
Years	-0.054	0.02	-0.419	-3.02	.004
Male	0.686	0.41	0.222	1.69	.098
Central Eastern	-0.421	0.43	-0.132	-0.98	.333
High School or Less	-0.244	0.67	-0.069	-0.37	.716
Some College	-0.250	0.71	-0.066	-0.35	.726
Some Grad School	0.451	0.70	0.109	0.65	.521
Masters	0.457	0.51	0.152	0.90	.375
Income Over \$75,000	1.090	0.55	0.363	1.98	.053
Income \$45,000-75,000	1.114	0.46	0.355	2.44	.019

The overall model was significant, $F(14, 44) = 2.77, p < .01$, and accounted for 29.9% of the variance (adjusted $R^2 = .299$). As shown in Table 58, belief scores were significant predictors of the willingness to be screened for colorectal cancer ($Beta = .424, p < .01$), indicating that while controlling for the other predictors, greater belief scores predicted more willingness to be screened. In addition, years living in the United States significantly predicted willingness to be screened for colorectal cancer ($Beta = -.419, p < .01$). In other words, living in the United States for more years predicted less willingness to be screened. Income was also a significant predictor of willingness to get screened. Specifically, incomes over \$75,000 marginally predicted greater willingness to be screened for colorectal cancer ($Beta = .363, p = .053$) and incomes between \$45,000 and \$75,000 predicted greater willingness to be screened ($Beta = .355, p < .05$). Finally, self-efficacy, knowledge, attitudes, age, ethnicity, and education were not significant predictors of willingness to be screened for colorectal cancer, all *ns*.

Qualitative Results

The PEN-3 model by Airhihenbuwa guided the qualitative data analysis. This process involves an initial review of the qualitative interview data and identifying themes that influence screening behavior and attitudes among participants. This involved a thorough review of all interview notes and transcripts. After the review, responses were coding, grouping from broad to specific. Through the coding process, the data evolved into specific categories related to specific themes discussed below. Codes and themes were further associated with the focus group question.

Ethnic-specific (Eastern vs. Central) focus group sessions were conducted to assist with participants comfort level and foster open communication. After analyzing the data, this stratification method yielded similar results between both ethnic groups thus, results are from the combined group rather than the original ethnic-specific groups.

Emergent themes from the qualitative portion included:

1. Amount of knowledge about colorectal cancer
2. Important factors for following ACS screening guidelines
3. Factors that influence Muslim men and women to follow ACS guidelines
4. Factors that act as barriers to following ACS guidelines by Muslim men and women
5. Beliefs about the prevalence of colorectal cancer within Central/Middle Eastern countries
6. Cultural considerations for health professionals serving Muslim men and women in relation to colorectal cancer screening

Findings by Focus Group Questions

The following research questions were used in this study:

1. What do you know about colorectal cancer?

When asked what they know about colorectal cancer, a majority of participants (91. 7%) reported a lack of, or very minimal knowing about colorectal cancer. Their responses included statements such as “I don’t have a clue and I don’t think anyone else has clue either.” Other participants (9.3%) reported having some knowledge about

colorectal cancer. Responses included that they had heard about it, but were truly unaware of “what this disease is about” and “it is a cancer but don’t know much about it.” One participant stated that he understood that the cancer was the result of “interruption of the cell signal to stop cell proliferation lead [sic] to abnormal cell proliferation” (See Table 59).

Table 59

Summary of Qualitative Answers About Amount of Knowledge About Colorectal Cancer

Lack of Knowledge	n	%
No knowledge	8	66.7
Minimal knowledge	3	25.0
Some knowledge	1	8.3

2. What factors do you believe are important for one to follow ACS screening?

When asked about the important factors for following ACS screening, all participants (100%) stated that the screening tests’ affordability were a major reason that people would or would not follow recommended ACS screening (n = 12). As shown in Table 60, responses included statements such as “number one affordability, especially for low income” and “for some people [sic] is the difference between feeding your family or getting tested.”

Table 60

Important Factors and Example Statements for Following ACS Screening Guidelines

Important factors to follow ACS screening

Affordability

Number one affordability especially for low income

For some people is the difference between feeding your family or getting tested.

3. *What do you believe would influence Muslim men and women to follow to ACS guidelines for CRC screening?*

When asked about the factors that would influence Muslim men and women to follow ACS guidelines, several participants (41.7%) stated that the factors were not specific to just Muslim populations (n = 5). Examples of these statements included “I don’t think there should be any exceptions for Muslims, no matter the ethnicity, beliefs or religious practices that might exist or outside of Muslims [sic] communities but they need to let them know” and “not be [sic] limited to Muslim community at all...disease doesn’t discriminate.” Other participants (33.3%) stated that privacy was an influence on following ACS guidelines (n = 4). Responses included “this matter is a very private issues, so physicians must be educated regarding the approach used from Muslim men

and women” and “cancer is so private (personal) it takes much more education and has nothing to do with religion particularly.” Finally, participants (25.0%) reported that physicians’ knowledge, or lack of knowledge, of Muslim traditions were also an influence for Muslim men and women (n = 3). Responses included physicians are not familiar with Muslims [sic] traditions unless the immigrants present at the physician's office and they been infected.”

4. *What factors do you believe act as barriers for Muslim men and women to follow to ACS guidelines for CRC screening?*

When asked about barriers that people might face to getting an ACS screening, some participants (33.3%) stated financial burden was a barrier (n = 4). Their responses included statements such as “lack of health insurance,” and “lack of adequate income to meet the co-pays.” Other participants (41.7%) listed lack of education as a potential barrier for Muslim men and women (n = 5). Their statements included “...we need to educate our people to the seriousness and understanding this disease.” Finally, participants (25%) stated that elements of fear and shame were barriers to receiving an ACS screening (n = 3). Their statements included “we feel it is our fault that we may have cancer,” and “don’t want know if anything is wrong so they won’t get tested” (see table 62).

Table 61

Factors that Influence Muslim Men and Women to Follow ACS Guidelines

Influential Factors

Generalizable Factors

-I don't think there should be any exceptions for Muslims, no matter the ethnicity, beliefs or religious practices that might exist in or outside of Muslims communities but they need to let them know

-not be limited to Muslim community at all....disease doesn't discriminated

Privacy

-This matter is a very private issues, so physicians must be educated regarding the approach used for Muslim men and women

-Cancer is so private it takes much more education and has nothing to do with religions particularly

Traditions of Muslims

-Physicians are not familiar with Muslims [sic] traditions unless the immigrants present at the physician's office and they been infected

Table 62

Factors That Act as Barriers for Muslim Men and Women to Follow ACS Guidelines

Barriers

Financial Burden

- Lack of health insurance
- Lack of adequate income to meet the co-pays

Lack of Education

- Lack of understanding colorectal cancer
- Lack of understanding severity of colorectal cancer

Elements of Fear and Shame

- We feel it is our fault that we may have cancer
- Don't want know [sic] if anything is wrong so they won't get tested

Culture

you can be a born American converting to Islam and listen to others who say a Muslim cannot be seen by a male you may not go and do it

- Even if you were born here you may still hold back because of the accessibility of female doctors

Trust

- every time you turn around, they come up with some kind of new testing so you never know which information is accurate and don't know when is inaccurate
-

In addition to above statements, participants (16.7%) stated that culture is an important barrier to adhering to preventative screening guidelines (n =2). The issue of culture was discussed further and determined by the facilitator that a lack of availability of female physicians was an issue preventing screening. Several participants (n = 7, or 58.3% of the entire focus group) viewed the lack of female physicians to be a large problem. Participants' statements included "you can be a born American converting to Islam and listen to others who say a Muslim cannot be seen by a male you may not go and do it....blue eyes and blonde hair don't matter if you fall in the hands of those who are ignorance and then you may not be willing to take part in these." Finally, some participants (67.7%) mentioned the issue of "trust" surrounding western medical belief (n = 8), stating that "every time you turn around, they come up with some kind of new testing so you never know which information is accurate and don't know when is inaccurate."

5. *How common do you think colorectal cancer is within Central/Middle Eastern countries?*

As to the prevalence of colorectal cancer within Central and Middle Eastern countries, a majority of participants (75.0%) stated that there was a low prevalence of the cancer due to dietary habits as well as lack of alcohol consumptions (n = 9). Some participants (16.7%) stated that there is a difference between the incidence rates of Central/Middle Eastern Muslim people that live abroad versus Muslims immigrants living in the United States (n = 2). One of responses was, "depends on Middle Eastern

who live here or the ones who live abroad...for the ones that live here probably the percentage is about the same especially if you live here for about 3- to 40 years.” The responder continued that “the diet becomes westernized so it’s going to even out....comparing country to country is a different story...but I don’t think we are any different than ‘white Caucasians.’” One participant, (8.3%) however, expressed that the incidence is higher overseas due to lack of access to healthcare and adequate dietary intake (See Table 63).

Table 63

Beliefs About the Prevalence of Colorectal Cancer Within Central/Middle Eastern Countries

Beliefs about Prevalence of Colorectal Cancer

Low Prevalence

Statement about dietary habits

Statement about lack of alcohol consumptions

Differences between Living in United States versus Living Abroad

-depends on Middle Eastern [sic] who live here or the ones who live abroad-the one who live here probably the percentage is about the same especially if you live here for about 3-to 40 years.

-The diet becomes westernized so it's going to even out...comparing country to country is a different story. But I don’t think we are any different than 'white Caucasians.'

6. *What cultural considerations should health professionals consider when working to create education and treatment services related to CRC for Muslim men and women?*

When asked about cultural considerations that health professionals should consider, a majority of respondents (67.7%) stated that physicians should be culturally sensitive to Muslim patients ($n = 8$). Statements included “as physicians learn about Muslims, it make their life easier to take care of these patients,” “optimal medical care,” and “even educational pamphlets should be sensitive to this population.” Other statements spoke to the concern that health professionals need to introduce screening tests cautiously and avoid overwhelming their patients. Few participants (25.0%) expressed that individuals are responsible to educate others regarding screening tests ($n = 3$). They added that these educational opportunities may be present to encourage an awareness campaign on special Muslim religious holidays, such as Eid Fitr “when everyone go to Eid prayer, we have to ask Imam to talk about colon cancer” (see Table 64).

Summary

The primary purpose of the present study was to assess the factors that predict colorectal cancer (CRC) screening among Muslim adults ages 50 years and older who immigrated to North Texas from Central/Middle Eastern countries as well as assessing their knowledge, attitudes, and beliefs about colorectal cancer. Participants’ level of self-efficacy was also measured as it related to colorectal cancer prevention and risk reductions. This study also assessed the knowledge, attitudes, and beliefs about CRC

among this group, and measured their level of self-efficacy as it relates to CRC prevention and risk reduction. Results showed that participants with increased income were not worried about embarrassment or pain from having the procedures compared to those with lower incomes. Those who had higher levels income were more willing to be screened for colorectal cancer than those who had lower levels of income.

Table 64

Cultural Considerations for Health Professionals Serving Muslim Men and Women in Relation to Colorectal Cancer Screening

Cultural Considerations

Sensitivity to Muslim religion and way of life

- as physicians learn about Muslims, it make their life easier to take care of these patients
 - Even educational pamphlets should be sensitive to this population
 - Optimal medical care
 - When everyone go to Eid prayer, we have to ask Imam to talk about colon cancer.”
-

Those who were knowledgeable about the ideal age for colorectal cancer and the various procedures used to screen for this cancer were more willing to be screened. Participants’ with higher self-efficacy scores were more likely to have been screened for

colorectal cancer. Finally, participants who had a higher belief scores, that is, understanding that it was important to diagnosis this cancer early, knowing the survival rate of cancer, and the seriousness of having colorectal cancer diagnosed at a late state were more willing to be screened for colorectal cancer.

Overall responses in focus group setting presented major issues. These issues were affordability of screening tests for all, the lack of insurance reimbursement, and amount the co-pay which exists with these tests. The second issue, dietary and low alcohol consumption within this population could be the success of low incidence. However, one of the participants suggested that lack of proper dietary intake and a deficiency of screening tests could be the result of high incidence with this population.

The final barrier stated was the cultural factors, which is associated with participation of this population in the screening tests. The lack of trust issue regarding western medical advice was mentioned during discussion. Too, access to physicians of the same gender as the patient was noted as a dependent factor determining preventative screening. Finally, stated as a promoter or barrier is that each individual must educate other Muslim individuals regarding screening tests and Muslims are uneasy discussing such subject matter.

CHAPTER V

DISCUSSION

The purpose of this mixed-method study was to examine the factors which predict colorectal screening among Muslim adults who immigrated to North Texas. These factors included knowledge related to colorectal cancer screening, attitudes toward colorectal cancer screening, and cultural beliefs about colorectal cancer screening. The perceived cognitive ability of this population which also involves participants' self-efficacy, was also examined. Furthermore, gender, education, income level, length of residency in United States, and health behavior were observed in great detail. Finally, the cultural factors which either promote or deter from CRC screening was assessed through focus groups.

The overall summary revealed that the participants who were knowledgeable about the colorectal cancer and associated procedures demonstrated more willingness to comply with screening procedures. Additionally, participants with higher self-efficacy scores were more willing to be screened for colorectal cancer and participants with higher belief scores were also more willing to be screened for colorectal cancer. The key finding in this study surrounded respondents' income level, specifically, those who had higher levels income were more willing to be screened for colorectal cancer.

Research Hypotheses

H1: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of knowledge about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.

H2: Gender, education, self efficacy, acculturation, and income are significant positive predictors of attitudes about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.

H3: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of beliefs about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.

H4: Gender, education, self-efficacy, acculturation, and income are significant positive predictors of screening behavior among Central/Middle Eastern Muslim men and women immigrants in North Texas.

Research Questions

1. How does *cultural identity* impact adult Central/Middle Eastern Muslim men and women's colorectal screening behavior?
2. How do factors relating to *cultural empowerment* impact adult Central/Middle Eastern Muslim men and women's colorectal screening behavior?
3. How do *familial and social relationships* among Central/Middle Eastern Muslim men and women's impact their colorectal screening behavior?

Hypothesis Summary

As it shown in the Table 65, all four hypotheses were rejected. Findings of each hypothesis as well as the implications of each finding are discussed separately in each section below.

Table 65

Summary of Hypothesis: Rejected or Not Rejected

Hypothesis	Hypothesis Rejected or Not Rejected
1. Gender, education, self-efficacy, acculturation, and income are significant positive predictors of knowledge about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.	Hypothesis Rejected
2. Gender, education, self efficacy, acculturation, and income are significant positive predictors of attitudes about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.	Hypothesis Rejected
3. Gender, education, self-efficacy, acculturation, and income are significant positive predictors of beliefs about colorectal cancer among Central/Middle Eastern Muslim men and women immigrants in North Texas.	Hypothesis Rejected
4. Gender, education, self-efficacy, acculturation, and income are significant positive predictors of screening behavior among Central/Middle Eastern Muslim men and women immigrants in North Texas.	Hypothesis Rejected

Summary of the Findings

The current study found that participants were somewhat worried about the colorectal cancer procedures being embarrassing and painful. Results also indicated that participants had some knowledge about colorectal cancer. Additionally, participants agreed about the necessity of being tested for colorectal cancer and the necessity of being diagnosing colorectal cancer early. Respondents reported being somewhat confident in their ability to schedule colorectal cancer screening tests and being able to talk about their health concerns with their care provider. Finally, participants were somewhat willing to be screened for colorectal cancer.

Knowledge

Majority of participants responded as they knew nothing, or knew a little, about the testing age for colorectal cancer nor screening procedure associated with colorectal cancer. Interestingly, there was no significant association between age and knowledge. One might have thought that increased of age would increase knowledge, however, in this population there was no such association.

Similar results were noted when the focus group was asked questions such as “What do you know about Colorectal Cancer?” A majority of participants responded that they knew nothing about colorectal cancer or they had very little knowledge information surrounding colorectal cancer. They related this lack of knowledge to the lack of colorectal cancer awareness campaigns, and this lack of knowledge may be associated with the failure to follow the ACS guidelines. This finding may be seen in

examination of Cultural Identity of PEN-3 Model in relation to Persons and Neighborhood. The focus group agreed that there was a lack of individual knowledge regarding colorectal cancer; however, an awareness campaign could have significant impact of increasing knowledge among in the Muslim population.

Wolf et al. (2005) suggested that lack of knowledge of screening tests may result in poor participation in screening. A similar study conducted by Shokar, Vernon & Weller (2005) report a similar finding. Participants' who have a lack of understanding about cancer and cancer screening procedures indicated that lack of understanding about cancer and associated cancer screening procedure typically do not get screened for cancer. A comparable report demonstrated that the participants lack understanding of associated screening terminology resulted in poor compliance to screening tests (Farmer, Reddick, D'Agostino & Jackson, 2007).

Winawer (2007) also reported that overall survival of colorectal cancer is directly related to early detection of that cancer. Knowledge was one of the factors which had an impact on the compliance with colorectal cancer screening. A high risk of non-compliance exists when the individual does not fully understand how these screening procedures can increase their survival rate if they are diagnosed with cancer. It is imperative that individuals understand how screening tests would impact the disease process (Winawer, 2007). Having knowledge, however, does not always mean that the individuals would comply or continue to comply with colorectal cancer screening. Some elderly people refuse screening procedures due to age, deteriorating health, or concerns

about the tests' effectiveness (Lewis, Kistler, Amick, Watson, Bynum, and Walter, 2006).

Attitude Screening

A majority of participants reported being extremely worried about colorectal cancer screening procedures. They also reported that colorectal cancer screening procedure would be embarrassing or that those procedures would be painful. Less than half of participants, however, reported that they were not worried about the procedure being embarrassing or painful. Furthermore, men reported being not worried about the embarrassment of having procedures while women reported being somewhat worried about the embarrassment of having screening procedures. The issue of embarrassment is documented as more worrisome for women than men. The focus group reported that possibly having a physician of the same gender could also be an issue that is a promoter or barrier for this population. In the study of attitude toward colorectal cancer, the main reason that participants saw as barriers to screening tests were "shame" or "embarrassment" (Robb, Solarin, Power, Atkin & Wardle, 2008). Furthermore, Wolf et al. (2005) suggested that negative attitudes toward available screening tests have been associated with non-compliance in participation of screening guidelines.

To compare this result with the focus group findings, little association between attitude and adhering to ACS screening guidelines has been noted. During the focus group, however, many of the participants used the term "trust" which can be important variable for future researchers to study and measure. The concept of trust may have been

used as substitution for attitude; however, this is only assumption and was not examined by this study. This focus group experienced the same result possible embarrassment and pain associated with the procedure in regard to attitude items. When asked about being worried if the screening procedures being painful or embarrassing, they responded as “extremely worried” or “somehow worried” toward colorectal cancer screening procedures. This attitude could be related to the fact that Central/Middle Eastern Muslims in North Texas have minimum knowledge of colorectal cancer, which could be indicative of being unaware that invasive procedures such as sigmoidoscopy are usually performed with conscious sedation. Furthermore, pain is a subjective expression, therefore, one person’s report of pain may be different than others (Lubarsky, Candiottie & Harris, 2007). In addition they may be unaware that health care providers usually maintain appropriate level of privacy when performing these procedures.

One of the components of PEN-3 is Relationships and Expectations which consist of the Perception, Enablers, and Nurtures. The result of the attitude variable reveals the importance of Perception and Enablers component. The concern for same gender physician by the focus group, and the fact that women reported more worrisome than men with concept of shame and embarrassment validates the need for health educator to address this concept when formulating cultural program for this population. The element of privacy and availability of these physicians will empower this population to adhere to ACS guidelines.

Clearly, challenges exist for health educator to identify various methods to reach out to this population for health information. At the national level, health educators need to conduct studies to identify the best way to communicate health issues with these patients. At the state level, dialogue between different academic institutions of health studies to collaborate might be avenues to reach out to this population. Finally, at the local level, small groups through gate keeper of the community may also provide channels of communication. The lack of communication for colorectal screening procedures by referring professionals may be related to low compliance for sector of public. In a study of Hispanics and low education patients did not receive counseling from their health care professionals for screening procedures (Wee, McCarthy, & Phillips, 2005). Therefore, it is imperative for health professionals and educators to provide their patients of available screening procedures.

Belief

Participants agreed on the necessity to diagnose colorectal cancer early and also agreed on understanding the survival rate of colorectal cancer if diagnosed early. Participants also agreed on the seriousness of diagnosing colorectal cancer too late to treat the disease. It is unclear, however, if this belief is associated with the general term of “cancer” or if it was concerned with the phrase “colorectal cancer.” People usually get upset when they hear word cancer. ACS (2008) reported that most people associate the word cancer with death. Therefore, in this study, it is unclear if this particular population “agreed” out of fear of cancer in general or if it was specific to colorectal cancer.

In general, participants who had a higher belief scores were more willing to be screened for colorectal cancer. Interestingly, participants agreed on getting tested if they were recommended by a friend. This can be categorized under the result of the Neighborhood construct of the PEN-3, which explains that the target ought to be a neighbor rather than individual person to obtain maximum end result for a health educator. Furthermore, when the construct of Nurturers is present, one can help others to achieve certain goals. Both of these elements are important to consider when offering health promotion program.

Self-Efficacy

Participants were “somewhat confident” to “pretty confident” in their ability to remember when to seek a CRC screening, ability to schedule a CRC screening, and their ability to schedule an appointment for a CRC screening. Additionally, participants reported being “pretty confident” in their ability to ask questions about changes in their bowel habits and ability to ask questions about the colorectal cancer screening tests. Finally, participants reported that they were “pretty confident” in their ability to talk about colorectal cancer with their health care provider. These results revealed moderate levels of self-efficacy. Self-efficacy, or an individual’s confidence in his or her ability to function or participate in a behavior, is an important factor to successfully adhere to a particular behavior (Ramirez, Velez, Chalela, Grussendorf & McAlister, 2006). Furthermore, Bandura (1994) defines self-efficacy as people’s faith of their capabilities

to acquisition, organized and utilize information to reach their designated level of performance.

The result of this study reveals that participants did not have high self-efficacy. Ultimately, this result means that participants with low score on self-efficacy also meant less willingness to adhere to screening procedures. A strong association exists between patient's adherence to heart failure management and the concept of self-efficacy. The study emphasizes on the concept of self-efficacy as a positive predictors to salt intake and exercise regiments. The cognitive abilities to substitute dietary salt intake and perform routine exercise were significant predictors in this study (Hopp, 2008). Cross, March, Lapsley, Byrne & Brooks (206) also reported of the similar result in the study of Patient self-efficacy and health locus of control. Self-efficacy was strongly associated with less disability. Therefore, the patients with higher self-efficacy were more willing to change current health behavior than the patients with the low self-efficacy.

In this study, self-efficacy was a strong predictor of willingness to the screening behavior. Therefore, low self-efficacy can be a worrisome issue for health professionals and educators. Ironically, the issue of self-efficacy was not the concern of the focus groups. This could be that participants (those who participated in the survey section or the focus groups participants) are unaware of the importance of making the appointments, asking questions regarding their bowel changes, and etc. due to lack of knowledge. Therefore, may be if they had knowledge of colorectal cancer screening, they would have a high self-efficacy score. The acquisition of the maximum amount of

knowledge and utilization the information (knowledge) could lead to a greater willingness to be screened.

The role of health educator therefore remains challenging because focus group participants were unaware of the importance of this concept in relation to screening behavior. By offering and providing several information sessions in local religion centers, health professionals and educators can obtain very basic level of information to Muslims in North Texas. The next step would be to empower this population by overcoming language barriers, overcoming gender issues, overcoming any negative health practices which exist in this community. Finally, reviewing the PEN-3 model, the success of any interventions is dependent on to identify gate keepers within the Muslim community, such as respected leaders in these centers.

Screening Behavior

Participants who had heard of colorectal cancer are more likely to have been seen by a health care provider for a CRC screening. Additionally, those who reported “know a lot” about the tests for colorectal cancer are also more likely to have had a CRC screening. Furthermore, participants who were familiar with screening procedures were also more likely to having had a CRC screening. Conversely, participants who reported knowing little or none about colorectal cancer were less likely to adhere to CRC screening. Screening behavior was significantly improved by increasing Latinos’ knowledge through cancer awareness campaigns.

In addition, suggestion of the screening procedures by their primary care provider also lead to increase in screening behavior (Guerra, Dominguez & Shea, 2005).

Knowledge, therefore, is an important predictor of screening behavior however, as of any health issue, knowledge is not the only predictor factor. Those who had higher levels income were more willing to be screened for colorectal cancer than those who had lower levels of income. Disparities in income level clearly have significant impact on the screening behavior. People with lower incomes were less likely to be screened for cancer (McAlearney et al, 2007).

Gender

In the current study, results demonstrated that gender did not show a significant association between willingness to be screened. Additionally, gender and ethnicity did not have a significant effect on participants' willingness to be screened for colorectal cancer. Finally, knowledge, attitude, belief and gender did not have a significant association with gender. Results demonstrated that significantly more men participated in this study than women; however, the investigator is unable to explain the gap associated with number of female versus male participants. One possible explanation may be that Muslim men are more willing to participate in research studies than Muslim females.

In the focus group, women participants suggested that the availability of same sex physicians was a factor for the willingness to be screened for colorectal cancer. Women are more likely to be seen by an OB/GYN if the physician is also a woman.

Additionally, women are more likely to comply with screening guidelines for breast and cervical cancers if the attending physician was also a woman (Lurie, Margolis, McGovern, Mink & Slater, 2007). Additionally, women patients preferred to wait up to thirty days for a female endoscopes physician rather than seeing a male physician (Menesse, Inadomi, Korne, & Elta, 2006). Therefore, it is unclear that if this study had captured more female participants, than the issue of income might have not been so significant.

Education Level

There were no significant associations between educational levels and screening behavior. There was, however, a marginal association between knowledge and education levels. Participants who earned a PhD or Post Doctorate degree typically had more knowledge of colorectal cancer screening and associated procedures than those with lesser degrees. This result is consistent with past research, which states that people with lower educational levels typically have lower compliance with cancer screening procedure (Chen et al., 2006; Kamangar et al., 2006).

Income

Income also had a significant effect on attitudes. Participants with higher income were less likely to be worried about colorectal associated procedures. Income had a significant effect on willingness to be screened for colorectal screening. Finally, income levels significantly predicted participants' willingness to be screened for colorectal cancer. As participants' income levels increased, they were significantly more likely to

be screened for colorectal cancer. Annual income also had a significant effect on knowledge, that is, participants with higher income significantly showed greater knowledge scores.

Within the African American population, one of the reasons for lack of willingness to be screened is related to income level (McAlearney et al., 2007). Lower income levels were also associated with the prevalence of colorectal cancer within this population (Lawsin, Duhamel, Weiss, Rakowski, & Jandorf, 2007). Finally, within the Asian population, lower income was linked to lower cancer screening rates (Wong, Glidenogrip, Nguyen, & Mock, 2005). Based on the results of the current study, health educators could potentially formulate educational sessions for Muslim population in North Texas. They could also assist this population to identify and to qualify for federal and state funding, such as Medicare and Medicaid.

Acculturation

The number of years living in the United States was significantly correlated with cultural empowerment (self-efficacy) items. The number of years living in the United States, however, did not have an effect on willingness to be screened for colorectal cancer. A study by Wong et al. (2006) suggested, however, that longer residency in the United States was a factor in adhering to cancer screening procedures. The current study suggests that trust of Western medicine could have a negative impact on the lack of willingness to be screened for colorectal cancer. Additionally, participants in the focus group mentioned that they were unable to assess the accuracy of the health information

that had been given throughout the years. The statement was made that they are unable to distinguish what was accurate versus inaccurate information as health information is continuously updated through the years. The perception which exists with Relationships and Expectations dimension of the PEN-3 model emphasizes the acceptance of health information originating from mainstream communities. Moreover, health educators may be capable of applying “Pedagogy of the Oppressed” to this population to increase education as to provide access and empowerment.

An interesting point was mentioned during the focus groups regarding acculturation. One statement made by participants in the focus group stated that “you can be a born American converting to Islam and listen to others who say a Muslim woman can not be seen by a male you may not go and do it....blue eyes and blonde hair don’t matter if you fall in the hands of those who are ignorant and then you may not be willing to take part in these.” Therefore, it did not matter as how long someone lived in the United States; it could be the suggestions and comments by other Muslim may be a barrier to obtain colorectal cancer screening. Health educator can elaborate on this perception and to educate, empower, and involve other Muslim individuals who are in the health care system to teach their own community of positive outcome of these screening procedures.

Future research could also focus on the degree to which Muslims feel connected with the mainstream America as it is not always the length of residency in the United

States that affects willingness to be tested for colorectal cancer and potentially other cancers.

Clearly, the role of health educators can be validated as the creator and facilitator of tailored screening program for Central/Middle Eastern Muslim in North Texas at the local level by identifying gatekeepers or community centers. Campo, Askelson, Routson, Graaf, Losch & Smith (2008) reported the effectiveness of tailoring programs for colorectal cancer screenings for rural areas of the Midwestern United States. They found that programs at the national level were unsuccessful regarding cancer screening guidelines. To evaluate the PEN-3 model, again, the dimension of Cultural Identity can help health educators with effective intervention. To understand the target audience as Person, Neighbor, and Community at the local level could potentially create a good rapport and positive relationships between health educators/professionals and the target audience (Airhihenbuwa & Webster, 1994).

In the focus group discussion, participants spoke about the need to educate physicians to familiarize themselves with basic Muslim beliefs and associated rituals. One of the dimensions of the PEN-3 model is cultural empowerment. The aim of this domain is to ensure that strategies which are used in health planning not only impact the bad practices but also to promote positive behavior. Positive cultural influences must be incorporated into health education programs. Existential cultural influences are practices which pose no threat to health behaviors but negative cultural influences which pose barriers toward achievement of healthy behaviors. For example, in Islam, excessive

consumption of meat and/or poultry is discouraged. There is a very specific statement in Islam which states that “avoid making your stomach, the cemetery of animals. This point is the example of the positive cultural health practice. The example of existential cultural influence is to discourage Muslims from drinking alcohol. Consumption of moderate amount of alcohol in western medicine does not pose a negative or positive health practice. Finally, the example of negative health behavior that some of the religious leaders discourage women to seek medical care through male health providers which is really it is not a fact in Islam faith.

Wong et al.’s (2005) study of disparities among Asian American and Latinos suggested that another way to reach target groups could be through ethnic media campaigns, informational commercials, posters, and community campaigns to potentially improve individuals’ colon health. Interestingly, participants in this current study suggested a similar solution. They suggested that media campaigning and involving Muslims to encourage other Muslims to be tested was the best method to educate about colorectal cancer, its prevalence and overall survival rates.

When applying the PEN-3 model, findings for Persons, Extended family, and Neighborhood show that the community is the target audience. Therefore, the Muslim population was identified as a close support system, however, the focus group also presented the issue of an individual’s sense of fear or shame if they are diagnosed with this disease. Additionally, the issue of individual responsibility arouse as Muslims in the

North Texas usually seek medical treatment when there is something wrong, and fail to practice preventive measures.

Additionally, the focus group participants mentioned that limiting the amount of alcoholic drinks and limiting the amount of red meat in their daily diets could potentially be factors for lowering the incidence of colorectal cancer in the Muslim population. Health educators could therefore utilize these findings to educate lower income communities about healthier dietary options. Perhaps if North Texas Muslims are unable to afford colorectal cancer screening, they would potentially lower their risk of developing colorectal cancer by changing their dietary habits.

Finally, a summary of the findings showed that ethnicity did not have strong impact on screening behavior. Even though, each Central/Middle Eastern countries adhere to their own cultural practices. In general, the focus group validated these findings as suggested that religion and ethnicity were not influential factors for screening behavior. It could be the assumption that cancer in general can occur in any population.

Limitations

There are five imitations identified with this research study:

1. Respondents who participated in this study were immigrants to United States and therefore, English was mostly likely not their first language. Although the length of residency varied among respondents, it is possible that they failed to understand the

terminology associated with the current study as well as the questions within the study.

2. The current study did not have equal numbers of men and women, that is, more men than women participated in the study as well as the focus group. It is unclear if the income variable associated with gender was skewed in regards to this study. It is possible that women, who typically have less income, could have had more education about colorectal cancer. Greater education may have had a positive impact on the amount of knowledge about colorectal cancer.
3. The third limitation was the variable of acculturation. In this study, definition of acculturation was measured by the length of residency in United States. However, the degree that one adheres to mainstream culture may vary significantly which changes the outcome of the measurement. For example, if someone lived in the United States for 15 years but immigrated at age of 20, the degree that he/she was able to adapt to mainstream American culture is more likely than an older adult who immigrated at age of 55. Therefore, may be if acculturation was measured by the age of immigration as well as length of residency, it could provide a better understanding of this phenomenon in the Central/Middle Eastern Muslim population in North Texas.
4. The sample size suffered as the result of eliminating one of the very diverse Islamic centers due to historical event. Therefore, the study only met the minimum requirement for sample size of 126.

5. The study utilized a survey design rather than an experimental design, therefore, no cause and effect was measured except only correlation between variables was discussed.

Implications

Generally, knowledge, attitude, and belief have been identified as factors which have a strong impact on the individual's adherence to colorectal cancer screening. In this study, one of the major significant factors was income which results showed was the strongest predictor factor relating to screening behavior. Although, knowledge, attitudes, and beliefs, remain important factors, one's income plays more of a role.

The individuals with higher income were more willing to adhere to screening guidelines. This fact can assist health educators to locate or help these individuals to navigate the social system and to find services for lower income participants through collaboration with the local hospitals and even local governments. For example in North Texas, Dallas County and Tarrant County are examples of the few counties in Texas which offer low cost colorectal cancer screening. Furthermore, this information also can assist health educators to modify their interventions to ascertain allocating national funding for low income individuals; it may be through offering sliding scale screening for those within specific income level. Politicians in the United States are currently debating the need for a national health care system, which may help lower income people adhere to colorectal cancer screening guidelines.

Future Studies

Based on this study, several suggestions are proposed. First, it is important to replicate this study with a larger, cross sectional sample of Muslims. Although, income had a strong influence on self-efficacy over other factors, this needs further exploration to re-test this variable's influence on screening behaviors.

Second, because the issue of trust emerged as a theme from the focus groups, it is imperative to study the effectiveness of programs which evaluate the rapport between health professionals and educators within their community. The health educators and other health professionals receiving training at academic settings may need to study Muslim beliefs and basic rituals to educate themselves about this particular culture. The Muslim religion is the largest religious sect in the world, and those from Muslim faiths comprise a larger percentage of the world population (Ott, Junabi & Khaduri, 2003) therefore, it is likely that health educators and other health professionals living in large urban areas such as Dallas/Fort Worth will commonly care for Muslim patients. Furthermore, health education programs and services should be based upon culturally appropriate models, such as PEN-3 that allow program planners to build upon the cultural values and norms. Additionally, cultural empowerment should be discussed in a broader terms with informal and formal leaders within U.S. Muslim communities so they will be willing to take on an advocacy role for this particular population.

Third, findings of this study as well as similar studies about colorectal cancer , should be communicated to the Muslim population in order to educate them about the

prevalence of colorectal cancer within their community, morbidity and mortality rates and other associated factors. Furthermore, evaluating Congregation nursing and/or Pastoral health care for Muslim centers could be explored to see if a health education intervention would improve knowledge, attitudes, self-efficacy, and screening behaviors. Fourth, further studies are needed to see if the application of the PEN-3 model could potentially identify and predict factors which are promoters or barriers of colorectal cancer screening.

In addition to PEN-3, the results of this study suggest that the Social Support theory and Ecological Theory could be applied effectively used to explain factors that influence colorectal screening among the Muslim community. As the Social Support theory proposes, that family and leaders are the key components. Additionally, available resources is the promoter factor toward colorectal cancer screening. During the focus group discussion, the issue was raised that this population seeks treatment only when they are sick because of lack of resources, lack of trust, or the disbelief that they can be diagnosed with colorectal cancer. It is therefore important to explore these factors with constructs of Health Belief Model.

Summary

Based on evidence in the literature, CRC screening is strongly recommended by the NCI and the ACS to obtain a high overall survival rate. There are stipulations that financial resources as well as knowledge, attitude, and belief are important factors which are barriers or promoters of adhering to ACS colorectal cancer screening. This mixed-

method study used both quantitative and qualitative methods. A close-ended survey was used to assess the participants' knowledge, attitudes, beliefs, and screening behaviors. Focus groups were used to determine factors which promote or deter individuals from CRC screening. These focus groups received questions based on the PEN-3 model and would examine the extent to which cultural identity, relationships and expectations, and cultural empowerment influence knowledge, attitudes, beliefs and screening behavior among Central and Middle Eastern Muslim men and women.

Most importantly, the overall findings in this study suggested that income had a significant impact on screening behavior. Knowledge and education also had an impact on screening behavior. Participants of the focus group recommended having affordable health plans and to assist each other to in finding available resources. These recommendations generated new ideas which could help health educators to tailor their intervention and examine current intervention toward this population by reinforcing their role as a resource as well as a navigator to locate federal and state funding and/or educate others as how to ascertain this information. Additionally, it is important to involve even more Muslims providers and health educators in formulating tailored program as the local level.

Additionally, the focus groups suggested that the Muslim population can build on traditional beliefs and practices which actually promoted less cancer than those adopting more of Western lifestyles and habits. Since community and family are such important values within Muslim culture, Muslims can also encourage other Muslims (i.e. social

support) to adhere to screening guidelines. This information is essential for health professionals and educators to plan, implement, and evaluate effective interventions for Muslim communities which help to save thousands of lives.

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APPENDIX A
VERBAL ANNOUNCEMENT

Verbal Announcement

Ms. Fatemah Youssefi, the graduate student from Texas Woman's University, is conducting a study regarding colorectal cancer screening with Central/Middle Eastern population. Please take 15 minutes and help her out with completing this survey. Your participation is voluntary.

Thank you

APPENDIX B
FLYER/ANNOUNCEMENT



Call For Participants

Volunteer Opportunity

- What:** This study will examine the knowledge, attitudes, beliefs and self-efficacy you have in regard to colorectal cancer screening.
- When:** Surveys will be available between XXXX and XXXX
Group Discussions (Focus Groups) will be facilitated on xxxx and xxxxxx
- Where:** Group Discussions and surveys will be conducted at
Towheed Foundation, Momin Center, Irving Masjid, and ISNA
- Who:** Participants need to be of Central or Middle Eastern origin and be 50 yrs or older who were originally born in Central or Middle Eastern countries.
- How Long:** This survey will take approximately 15 minutes to complete.
The focus group will last approximately 1 hour.

If you are interested in participating in one of the 2 focus groups, please fill out the form on the back of this page and drop it in the box that is located in the lobby of your center. Provide your email or phone number, and you will be contacted if you are chosen to participate. The group discussion will consist of 6-8 people at a time.

Your participation is voluntary and survey results are confidential.

Please do not include your name on this survey.

For questions about this study, please contact Fatemeh Youssefi at (214) 557-4478 or fatemehy@verizon.net

Or

Dr. Jody Oomen-Early, Assistant professor of Health Studies at Texas Woman's University
at Joomen@twu.edu or (972) 786-2733

Back of Form

If you would like to participate in the upcoming focus groups on _____(date) please complete this form and drop in the box located in back of the main lobby.

First Initial: _____

Gender: _____male _____female

Age: _____ years

Way to contact (please provide one):

Email: _____

Phone: _____

Thank You!!

APPENDIX C

SURVEY COVER LETTER WITH ELEMENTS OF INFORMED CONSENT

Hello everybody,

My name is Fatemeh Youssefi, and I am currently a nurse and graduate student. I am completing my doctoral in Health Studies at Texas Woman's University. For my dissertation, I chose to study which factors will predict colorectal cancer screening among Muslim Central/Middle Eastern adults ages 50 and older as well as to identify factors which inhibit and/or promote colorectal screening among this group. For my study, I wanted to hear directly from Muslim adults about the mentioned variables so I am here today to ask you to volunteer to complete five short surveys. The surveys are anonymous and ask questions about your knowledge, attitude, belief, self-efficacy and general demographic information. You are eligible to participate if you have been originally born in Central/Middle Eastern countries and are 50 or older.

Your participation is voluntary and there will not be any financial incentives. However, if you choose to participate in the focus groups, food will be provided on the day or days assigned. Your participation is important because it gives you a voice in the gathering of information regarding colorectal cancer screening for you and Muslim communities.

Very little information is known about colorectal cancer in Muslim population from Central/Middle Eastern countries who live in United States. Based on the data results, I or other health educators plan to develop a health program to address any factors which inhibit or promote colorectal screening in Muslim population. The information you provide will be confidential and cannot be traced back to you. The surveys will not be shown to anybody but the research team, which consists of myself, my faculty advisor, Jody Oomen-Early, and my statistician. However, there are always potential risks and these are loss of confidentiality, and loss of anonymity. Our research team will take every step to minimize these risks to you.

Names will also not be used in the focus groups. You will be assigned a letter, (Participant A, Participant B, etc.) and all of the data collected in the focus groups will be reported as a group, not individually.

The survey will take you approximately 15 minutes to complete. The survey results are confidential. You do not have to reveal your name. Your participation is voluntary and there is no penalty for not participating. If you volunteer to participate and change your mind, you may stop at any time. If you complete the survey, please put it in the brown envelope with my name on it which is located in the lobby. If you choose to participate in the focus group, please fill out the back of the informational flyer, by including your first initial and phone or email so I can contact you if you selected.

You may contact me at fatemehy@verizon.net or (214) 557-4478 for further information or to clarify any element of the study. When the study is complete, you may also receive a summary of the results if you wish by contact me with your request. The results may be published in a peer-reviewed journal. Again, nothing in my study will personally identify you.

Your signature is not necessary. "Completion of this survey will signify your informed consent to participate in this study." Your completed surveys can placed in the survey box located in the center lobby.

Thank you
Fatemeh Youssefi

APPENDIX D

CANCER SCREENING SURVEY (CSS)

"Completion of this survey will signify your informed consent to participate in this survey."

Thank you for completing this survey. Please fill out this form to the best of your ability.
You do not need to include your name or any contact information.

Directions:

Place an "x" for each item, Only check one answer.

Knowledge

Have you heard of colorectal cancer?	I know nothing _____	I know a little _____	I know a lot _____
Have you heard of tests for colorectal cancer?	I know nothing _____	I know a little _____	I know a lot _____
Are you familiar with Flexible Sigmoidoscopy?	I know nothing about it _____	I know a little about it _____	I know a lot about it _____
Are you familiar with Fecal Occult Blood test?	I know nothing _____	I know a little _____	I know a lot _____
Are you familiar with the ideal testing age?	I know nothing _____	I know a little _____	I know a lot _____

Place an "x" for each item, Only check one answer.

Attitudes

Would you be worried that Flexible Sigmoidoscopy would be embarrassing?	Not worried _____	somewhat worried _____	extremely worried _____
Would you be worried Flexible Sigmoidoscopy would be painful?	Not worried _____	somewhat worried _____	extremely worried _____
Would you be worried that Fecal Occult Blood Test would be embarrassing?	Not worried _____	somewhat worried _____	extremely worried _____
Would you be worried that Fecal Occult Blood Test would be painful?	Not worried _____	somewhat worried _____	extremely worried _____

Please rate your agreement on each of the following statements.

Belief

	Strongly disagree	Disagree	No Opinion	Agree	Strongly Agree
It is necessary to diagnose colorectal cancer early	_____	_____	_____	_____	_____
I know the survival rate of colorectal cancer if found early	_____	_____	_____	_____	_____
It is serious to diagnose colorectal cancer late	_____	_____	_____	_____	_____
I know the chance of getting colorectal cancer:	_____	_____	_____	_____	_____
I would get tested for fecal occult blood test if a friend recommended it.	_____	_____	_____	_____	_____
I would get tested for flexible sigmoidoscopy if a friend recommended it.	_____	_____	_____	_____	_____

APPENDIX E

THE GENERAL SELF EFFICACY SCALE (GSE)

“Completion of this survey will signify your informed consent to participate in this survey.”

Directions: Please rate your agreement on each of the following statements.

Self Efficacy and Colorectal Cancer Screening

Place an “X” on the response that best reflects your agreement with the following statements

I feel confident in my ability to:	Not at all confident	somewhat confident	pretty confident	extremely confident	No opinion
remember when to seek CRC screening	_____	_____	_____	_____	_____
schedule appointment for CRC screening	_____	_____	_____	_____	_____
keep the appointment for CRC screening	_____	_____	_____	_____	_____
ask questions about					
a. changes in bowel habits	_____	_____	_____	_____	_____
b. screening tests	_____	_____	_____	_____	_____
c. results	_____	_____	_____	_____	_____
talk about colorectal cancer	_____	_____	_____	_____	_____
to my health care provider					

* CRC = Colorectal Cancer

APPENDIX F
DEMOGRAPHIC DATA

"Completion of this survey will signify your informed consent to participate in this survey."

Demographic information:

What is your gender: Female Male

What is your age:

What is your ethnicity: Eastern Central Eastern Middle

How many years have you lived in the United States?

What is your highest education level completed?

- a) Some high school
- b) High school graduate
- c) Some College/Associate Degree
- d) Some Graduate work
- e) Master's degree
- f) Ph.D.
- g) Post doctorate

What is your income level?

- a) 30,000 or less
- b) 30,001 – 45,000
- c) 45,001 – 60,000
- d) 60,001 – 75,000
- e) 75,000 – 90,000
- f) greater than 90,000

Have you ever seen any health care provider for CRC screening: Yes NO

* If no, how willing would be to get screened:

Not at all willing	A little willing	No opinion	Somewhat willing	Extremely willing
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APPENDIX G

INFORMED CONSENT FOR FOCUS GROUP

TITLE OF STUDY: "Factors Predictive of Colorectal Cancer Screening Among Muslim Men and Women from Central/Middle Eastern Countries Living in North Texas."

Investigator: Fatemeh Youssefi(214) 557-4478
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Advisor: Jody Oomen Early, PhD.....(940) 898-2848
Email: joomen@mail.twu.edu

PURPOSE: The research is for the researcher's dissertation. This mixed-method study is to examine the knowledge, attitudes, and beliefs about colorectal cancer screening as well as the to identify factors which inhibit and/or promote colorectal screening among Muslim Central/Middle Eastern adults.

DURATION: The total time requirement for this project is estimated at no more than
One hour:
To read and sign informed consent documents (5 minutes)
To participate in the focus group session (approximately 55 minutes)

PROCEDURES:

- 1- Informed consent will be obtained from all participants at the beginning of each session and locked in a secure cabinet.
- 2- Focus groups will discuss seven open-ended questions.
- 3- No further follow-up is required.

POSSIBLE RISKS/DISCOMFORTS: Three areas of concern have been identified as possible risks: the loss of confidentiality, experiencing emotional discomfort talking about colorectal cancer screening, and loss of anonymity. You may stop participation in discussions at any time and your responses will remain confidential. You are not required to disclose your name at any time for the focus group.

POSSIBLE BENEFIT: The outcome of discussions will provide valuable information to health care providers.

CONFIDENTIALITY: All information related to this study will remain confidential. At no time will participants be asked to disclose their name during focus groups session. The Health Studies Department at Texas Woman's University will maintain storage of this consent form. The researcher, Fatemeh Youssefi and dissertation chair, Dr. Oomen-Early will be the only people with access to the material. Additionally, an assistant will be present to audio-tape the session. Please note, results of this study may be published or presented. However, participants will never be named and their personal rights and privacy will always be maintained.

Participant initials

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The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

FINANCIAL COSTS: None

VOLUNTARY PARTICIPATIONS: Your participation in this study is 100% voluntary. Choosing to participate does not obligate you to provide any feedback or answer questions you are uncomfortable with. Please be aware that you can stop at any time during this study.

If you have any questions about the research study, you may ask the researchers' their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you contact the Texas Woman's University office of Research and Sponsored Programs at (940) 898-3378 or via e-mail at IRB@twu.edu. You will be given a copy of this signed and dated consent form to keep.

Your signature confirms that you have met the criteria to participate in this study as well as you have been informed of the possible risk and benefit of this study.

Participant Signature

Date

APPENDIX H
FOCUS GROUP QUESTIONS

1- What do you know about Colorectal Cancer?

2- What factors do you believe are important for one to follow to ACS screening?

[Probe: feasibility, affordability; access]

3- What do you believe would influence Muslim men and women to follow to ACS guidelines for CRC screening?

[Probe: family support, launching an awareness campaign]

4- What factors do you believe act as barriers for Muslim men and women to follow to ACS guidelines for CRC screening?

[Probe: family and social relationships; fear; religious influences; trust; acculturation].

5- How common do you think colorectal cancer is within Central/Middle Eastern countries?

[Probe: statistics; media; family history]

6- What cultural considerations should health professionals consider when working to create education and treatment services related to CRC for Muslim men and women?

[Probe: privacy; gender roles; trust; access]

7- What other comments do you have?